

**SONY**

COLOR VIDEO CAMERA

**BVP-750**  
**BVP-750P**



SERVICE MANUAL SP01561

**BACKUP FILE**

**Hyper HAD™**


MAINTENANCE MANUAL

Volume 1 1st Edition

Serial No. 10001 and Higher (BVP-750)

Serial No. 40001 and Higher (BVP-750P)

### SAFETY RELATED COMPONENT WARNING

Components identified by shading and  marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

#### CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's instructions.

#### Vorsicht!

Explosionsgefahr bei unsachgemäßen Austausch der Batterie.

Ersatz nur durch denselben oder einen vom Hersteller empfohlenen ähnlichen Typ.  
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

#### ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.

Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.  
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

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### X-RAY RADIATION WARNING

Be sure that parts replacement in the high voltage block and adjustments made to the high voltage circuits are carried out precisely in accordance with the procedures given in this manual.

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## Volume 2

### A. BLOCK DIAGRAMS

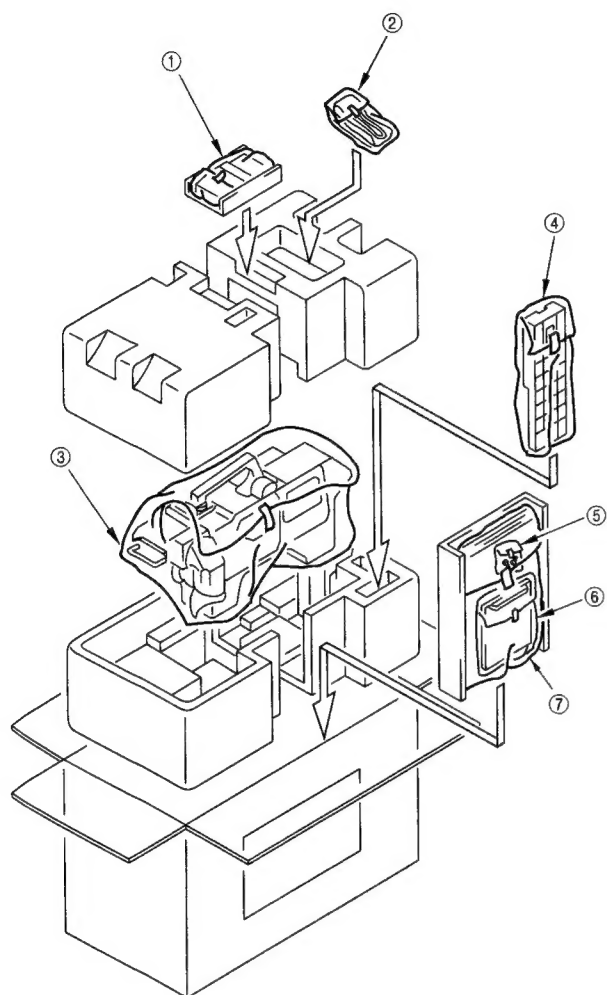
### B. SEMICONDUCTOR

### C. SCHEMATIC DIAGRAMS AND BOARD ILLUSTRATIONS

### D. SPARE PARTS

# SECTION 1 INSTALLATION

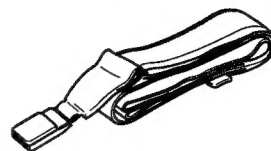
## 1-1. PACKING AND UNPACKING



- ① Chest pad
  - ② Shoulder belt, Cable clasper
  - ③ BVP-750/750P (with Front cover)
  - ④ Tripod adaptor VCT-14
  - ⑤ Fixing screws +B3×8
  - ⑥ Extension board EX-458
  - ⑦ Operation manual
- Maintenance manuals Vol.1, Vol.2

## 1-2. SUPPLIED ACCESSORIES

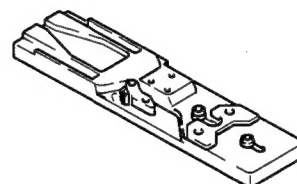
**Shoulder Belt:** 1 (Sony Part No. A-6772-374-A)



**Chest Pad:** 1 (Sony Part No. A-7401-157-A)



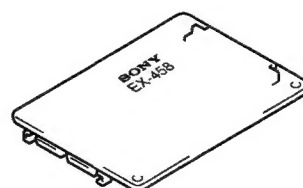
**Tripod Adaptor VCT-14:** 1



**Front Cover:** 1 (Sony Part No. A-8265-738-B)

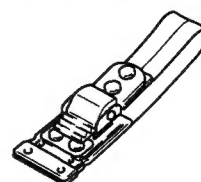


**Extension Board, EX-458:** 1 (Sony Part No. A-8265-739-A)



**Cable Clasper:** 1 (Sony Part No. 3-734-214-01)

**Fixing Screws +B3×8:** 2 (Sony Part No. 7-682-548-09)



### 1-3. CONNECTORS AND CABLES

#### 1-3-1. Connector Input and Output Signals

Main connector input and output signals are shown below.

##### [Output signal]

- MONITOR BNC 75  $\Omega$   
1.0 V p-p
- VBS BNC 75  $\Omega$   
1.0 V p-p

##### [Input/Output signal]

- PROMPT BNC 75  $\Omega$   
1.0 V p-p  
\*Switchable with  
S4/MD-99 board  
See Section 1-5 for details.
- TRIAX King type (for BVP-750)  
Fischer type (for BVP-750P)

TRACKER (10P, FEMALE)

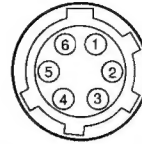


(EXTERNAL VIEW)

| No. | SIGNAL            | SPECIFICATION   |
|-----|-------------------|---|
| 1   | TRACKER R OUT (X) | TRACKER RECEIVE<br>0 dBu unbalanced                       |
| 2   | TRACKER T OUT (G) | GND for TRACKER T   |
| 3   | TRACKER R OUT (G) | GND for TRACKER R   |
| 4   | PGM OUT (X)       | -20 dBu unbalanced  |
| 5   | +12 V (T) OUT     | +12 Vdc 100 mA (MAX)                                      |
| 6   | PGM OUT (G)       | GND for PGM   |
| 7   | TRACKER T IN (X)  | TRACKER TALK<br>0 dBu/-20 dBu<br>High impedance, balanced |
| 8   | TRACKER T IN (Y)  |   |
| 9   | GND UNREG         | GND for UNREG   |
| 10  | R TALLY OUT (X)   | +5 V CMOS LEVEL   |

(0 dBu=0.775 V rms)

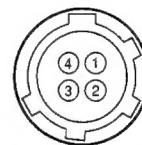
RET CONTROL (6P, FEMALE)



(EXTERNAL VIEW)

| No. | SIGNAL                | SPECIFICATION   |
|-----|-----------------------|---|
| 1   | INCOM 1 MIC ON/OFF IN | $Z_i \geq 10 \text{ k}\Omega$<br>ON: GND<br>OFF: OPEN |
| 2   | INCOM 2 MIC ON/OFF IN | $Z_i \geq 10 \text{ k}\Omega$<br>ON: GND<br>OFF: OPEN |
| 3   | GND                   |   |
| 4   | RET 3 ON/OFF IN       | $Z_i \geq 10 \text{ k}\Omega$<br>ON: GND<br>OFF: OPEN |
| 5   | RET 1 ON/OFF IN       | $Z_i \geq 10 \text{ k}\Omega$<br>ON: GND<br>OFF: OPEN |
| 6   | RET 2 ON/OFF IN       | $Z_i \geq 10 \text{ k}\Omega$<br>ON: GND<br>OFF: OPEN |

DC OUT 12 V (4P, FEMALE)



(EXTERNAL VIEW)

| No. | SIGNAL          | SPECIFICATION |
|-----|-----------------|---------------|
| 1   | GND             | GND for UNREG |
| 2   | NC              | No connection |
| 3   | NC              | No connection |
| 4   | UNREG +12 V OUT | +12 V dc 5 W  |

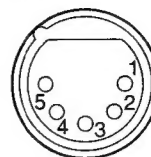
# REMOTE (8P, FEMALE)



(EXTERNAL VIEW)

| No. | SIGNAL        | SPECIFICATION                      |
|-----|---------------|------------------------------------|
| 1   | TX (+)        | BVP SERIAL DATA                    |
| 2   | TX (-)        |                                    |
| 3   | RX (+)        | CCU/MSU/RCP/CNU/VCS<br>SERIAL DATA |
| 4   | RX (-)        |                                    |
| 5   | TX GND        | GND for TX                         |
| 6   | POWER (+) OUT | +12 V, 500 mA (MAX)                |
| 7   | POWER (-) OUT | GND for +12 V                      |
| 8   | SPARE         | —                                  |
|     | CHASSIS GND   | CHASSIS GND                        |

# INCOM 1/2 (5P, FEMALE)

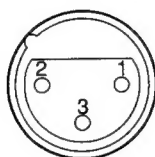


(EXTERNAL VIEW)

| No. | SIGNAL                    | SPECIFICATION            |
|-----|---------------------------|--------------------------|
| 1   | INCOM-1/-2 MIC<br>IN (Y)  | -20 dBu<br>(CARBON MIC)  |
| 2   | INCOM-1/-2 MIC<br>IN (X)  | -60 dBu<br>(DYNAMIC MIC) |
| 3   | GND (PGM)                 |                          |
| 4   | INCOM 1/ 2<br>RECEIVE OUT | 0 dBu                    |
| 5   | PGM 1/2 OUT               | 0 dBu                    |

(0 dBu=0.775 V rms)

# MIC IN 1/2 (3P, FEMALE)

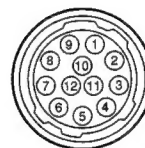


(EXTERNAL VIEW)

| No. | SIGNAL     | SPECIFICATION                      |
|-----|------------|------------------------------------|
| 1   | MIC IN (G) | -60 dBu High impedance<br>balanced |
| 2   | MIC IN (X) |                                    |
| 3   | MIC IN (Y) |                                    |

(0 dBu=0.775 V rms)

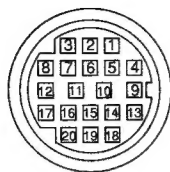
# LENS (12P, FEMALE)



(EXTERNAL VIEW)

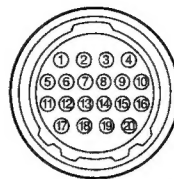
| No. | SIGNAL                 | SPECIFICATION                        |
|-----|------------------------|--------------------------------------|
| 1   | RET VIDEO<br>ENABLE IN | ENABLE: 0 V<br>DISABLE: +5 V or OPEN |
| 2   | RET 2<br>ENABLE IN     | ENABLE: 0 V<br>DISABLE: +5 V or OPEN |
| 3   | GND                    | GND for UNREG                        |
| 4   | AUTO +5 V OUT          | AUTO: +5 V<br>MANU: 0 V or OPEN      |
| 5   | IRIS CONT OUT          | +3.4 V (F16) ~<br>+6.2 V (F2.8)      |
| 6   | UNREG OUT              | +10.5 V ~ +17 V                      |
| 7   | IRIS POSITION IN       | +3.4 V (F16) ~<br>+6.2 V (F2.8)      |
| 8   | AUTO/MANU OUT          | AUTO IRIS: 0 V<br>MANUAL IRIS: +5 V  |
| 9   | EXTENDER<br>ON/OFF IN  | ON: 0 V<br>OFF: +5 V or OPEN         |
| 10  | ZOOM POSITION<br>IN    | WIDE: 2 V<br>TELE: 7 V               |
| 11  | (Spare)                |                                      |
| 12  | (Spare)                |                                      |

## VF (20P, FEMALE)



(EXTERNAL VIEW)

## EXT I/O (20P, FEMALE)



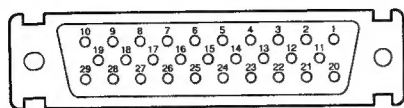
(EXTERNAL VIEW)

| No. | SIGNAL                          | SPECIFICATION                                       |
|-----|---------------------------------|---|
| 1   | (Spare)                         |   |
| 2   | ABNORMAL IND OUT                | ON: GND, OFF: OPEN                                  |
| 3   | 16:9 MODE OUT                   | ON: GND, OFF: OPEN                                  |
| 4   | (Spare)                         |   |
| 5   | (Spare)                         |   |
| 6   | CCIR/EIA OUT                    | CCIR: +8.8 V<br>EIA: 0 V, $Z_o=1\text{ k}\Omega$    |
| 7   | AUDIO IND IN                    | ON: 0 V, OFF: OPEN                                  |
| 8   | G TALLY OUT                     | ON: 4.5 V<br>OFF: 0 V or OPEN                       |
| 9   | (Spare)                         |   |
| 10  | (Spare)                         |   |
| 11  | ZEBRA $\overline{\text{ON}}$ IN | ZEBRA ON: 0 V<br>OFF: +5 V or OPEN                  |
| 12  | VF VIDEO OUT (X)                | VBS 1 V p-p, $Z_o \leq 100\ \Omega$                 |
| 13  | AUDIO CONT IN                   | 0 V (0 dB) $\sim$ +7 V (−20 dB)                     |
| 14  | (Spare)                         |   |
| 15  | (Spare)                         |   |
| 16  | BATT IND OUT                    | ON: +4.5 V<br>OFF: 0 V or OPEN<br>$Z_o=300\ \Omega$ |
| 17  | REC/TALLY OUT                   | ON: +8.8 V<br>OFF: 0 V or OPEN                      |
| 18  | +9.3 V (VF) OUT                 | REG +9.3 V  |
| 19  | GND                             | GND   |
| 20  | UNREG OUT                       | +10.5 V $\sim$ 17 V                                 |

| No. | SIGNAL           | SPECIFICATION                          |
|-----|------------------|--|
| 1   | NC               | No connection                          |
| 2   | NC               | No connection                          |
| 3   | RET 1 CONTROL IN | ON: GND, OFF: OPEN                     |
| 4   | RET 2 CONTROL IN | ON: GND, OFF: OPEN                     |
| 5   | NC               | No connection                          |
| 6   | NC               |  |
| 7   | NC               |  |
| 8   | NC               |  |
| 9   | RET OUT (X)      | VBS or Y 1.0 V p-p<br>$Z_o=75\ \Omega$ |
| 10  | RET OUT (G)      |  |
| 11  | B VIDEO OUT (X)  | V 680 $\pm$ 15 mV<br>$Z_o=75\ \Omega$  |
| 12  | B VIDEO OUT (G)  |  |
| 13  | NC               | No connection                          |
| 14  | NC               |  |
| 15  | GND (SHIELD)     |  |
| 16  | NC               | No connection                          |
| 17  | R VIDEO OUT (X)  | V 680 $\pm$ 15 mV<br>$Z_o=75\ \Omega$  |
| 18  | R VIDEO OUT (G)  |  |
| 19  | G VIDEO OUT (X)  | V 680 $\pm$ 15 mV<br>$Z_o=75\ \Omega$  |
| 20  | G VIDEO OUT (G)  |  |



# OHB (29P, FEMALE)



(EXTERNAL VIEW)

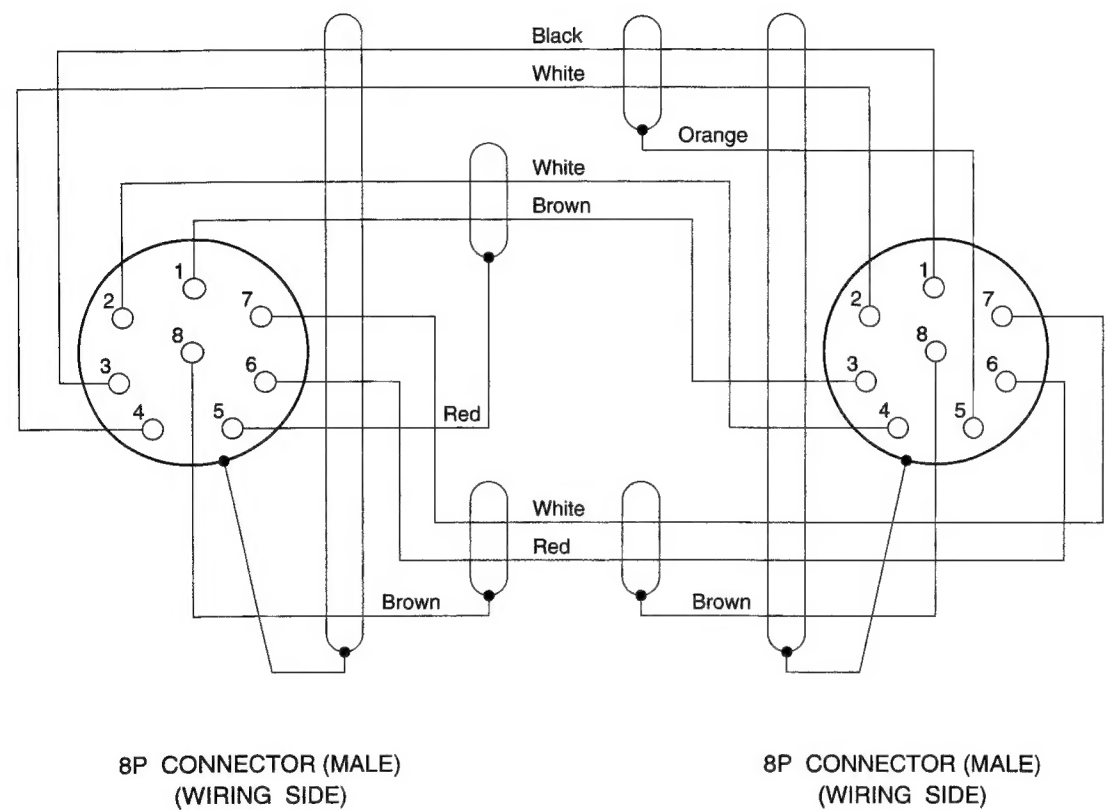
| No. | SIGNAL         | SPECIFICATION  |
|-----|----------------|--|
| 1   | R VIDEO IN (G) | GND for R VIDEO  |
| 2   | R VIDEO IN     | V=500 mV p-p<br>100% white, positive<br>Zi=22 Ω  |
| 3   | G VIDEO IN (G) | GND for G VIDEO  |
| 4   | G VIDEO IN     | V=500 mV p-p<br>100% white, positive<br>Zi=22 Ω  |
| 5   | B VIDEO IN (G) | GND for B VIDEO  |
| 6   | B VIDEO IN     | V=500 mV p-p<br>100% white, positive<br>Zi=22 Ω  |
| 7   | GND            |  |
| 8   | GND            |  |
| 9   | -11.5 V OUT    | -11.5 V dc   |
| 10  | GND (UNREG)    | GND for UNREG  |
| 11  | +15.5 V OUT    | +15.5 V dc   |
| 12  | +8.0 V OUT     | +8.0 V dc  |
| 13  | +5.5 V OUT     | +5.5 V dc  |
| 14  | TEMP IN        | 10 mV/°C<br>Low Impedance  |
| 15  | ND POSITION IN | ND-1: 0.4 V dc<br>ND-2: 1.45 V dc<br>ND-3: 2.50 V dc<br>ND-4: 3.55 V dc<br>ND-5: 4.60 V dc |

| No. | SIGNAL         | SPECIFICATION  |
|-----|----------------|--|
| 16  | RXD OUT        | CHU→OHB<br>0 – 5 V   |
| 17  | S. LD OUT      | Serial Data Load Pulse<br>Output   |
| 18  | -3.5 V OUT     | -3.5 V dc  |
| 19  | UNREG OUT      | 10.5 – 17.0 V  |
| 20  | HD OUT         | 0 – 5 V, negative  |
| 21  | +6.5 V OUT     | +6.5 V dc  |
| 22  | VD OUT         | 0 – 5 V, negative  |
| 23  | DIAG IN        | Open Collector   |
| 24  | CC POSITION IN | CC-A: 0.4 V dc<br>CC-B: 1.45 V dc<br>CC-C: 2.50 V dc<br>CC-D: 3.55 V dc<br>CC-E: 4.60 V dc |
| 25  | TXD IN         | OHB→CHU  |
| 26  | SHD IN         | 0 – 5 V, positive  |
| 27  | SHD IN (G)     | GND for SHD  |
| 28  | S. DT OUT      | Serial Data Output   |
| 29  | S. CK OUT      | Clock Input for Serial<br>Data   |

1-3-2. Cable Wiring

CCA-5 cable (for REMOTE connector)

CCA-5 CABLE (wiring diagram)



### 1-3-3. CCA-5 cable (for REMOTE connector)

Connection made with the connector panels during installation or service, should be made with the connectors/complete cable assemblies specified in the following list, or equivalent parts.

| Connector Name                    | Connection connector/cable  |
|-----------------------------------|---|
| MONITOR<br>PROMPT<br>VBS<br>(BNC) | 1-560-069-11 PLUG, BNC<br>or<br>B-B cable ASSY<br>(cable length 1.5 m, option)                  |
| TRACKER<br>(10P, FEMALE)          | 1-560-522-11 PLUG, 10P MALE<br>or<br>HIROSE HR10R-10P-10P<br>equivalent                         |
| RET CONTROL<br>(6P, FEMALE)       | 1-560-078-31 PLUG, 6P MALE<br>or<br>HIROSE HR10-7PA-6P<br>equivalent                            |
| DC OUT 12 V<br>(4P, FEMALE)       | 1-566-425-11 PLUG, 4P MALE<br>or<br>HIROSE HR10A-7P-4P<br>equivalent                            |
| REMOTE<br>(8P, FEMALE)            | 1-766-848-11 PLUG, 8P<br>MALE or<br>CCA cable ASSY (option)<br>CCA-5-10 (10 m)<br>CCA-5-3 (3 m) |
| MIC 1/2<br>(3P, FEMALE)           | 1-508-084-00 XLR, 3P MALE<br>or<br>CANNON XLR-3-12C equivalent                                  |
| INCOM 1/2<br>(5P, FEMALE)         | 1-508-370-11 XLR, 5P MALE<br>or<br>CANNON XLR-5-12C equivalent                                  |
| EXT I/O<br>(20P, FEMALE)          | HIROSE HR10A-13PA-20P<br>equivalent   |

## 1-4. INSTALLATION

### 1-4-1. Installation Conditions

Operating temperature: -20 °C to +45 °C

Storage temperature: -20 °C to +55 °C

Humidity: No condense

- Install the unit in a location as dry and well-ventilated as possible.
- Do not install the unit in the following conditions.
  1. High temperature room or near the heat source
  2. Excessive dust or mechanical vibration
  3. Intense magnetic and electric field
  4. A place subjected to direct sunlight or strong light

## 1-5. FUNCTION OF INTERNAL SWITCH

### PR-197A/197B board

- S901-1 (PEAK)

This switch selects a correction mode for the auto knee. When set to "OFF" (left side of switch), the inclination of the knee slope changes, and when set to "ON", the knee point changes prior to the inclination.

Factory-setting is "ON".

- S901-2 (WHITE CLIP OFF)

Use the switch for video signal adjustment. When set to "OFF" (left side of switch), the white clip processing is canceled.

Factory-setting is "ON".

- S901-3 (GAMMA OFF)

When the switch is set to "OFF" (left side of switch), instructions from the CCU becomes invalid and the gamma correction circuit is always turned OFF.

Factory-setting is "ON".

- S901-4 (BLACK GAMMA ON)

When set to "ON", the black gamma on/off control is enabled by an external equipment. When set to "OFF" (left side of switch), controls from the external equipment become invalid and the black gamma correction circuit is always turned ON.

Factory-setting is "ON".

- S901-5 (KNEE MAX ON)

Set the switch to "OFF" (left side of switch) for the knee point adjustment.

Factory-setting is "ON".

- S901-6: Not used

### EN-120A/120P board

- S1 (SELECT/Y ONLY)

This switch selects a signal to be output to the viewfinder. Factory-setting is "SELECT".

SELECT: A signal selected with MONITOR

SELECT switch on the left side of the camera

Y ONLY: Y signal

- S2-1 (ATT ON/OFF)

- S2-2 (CURSOR ON/OFF)

When using a 16:9 camera system and cutting off a 4:3 video signal, these switches select the indication mode of the picture on the viewfinder screen as shown in the figure.

S2-1 is factory-set to "OFF" and S2-2 is to "ON".



- S100-1 : Not used

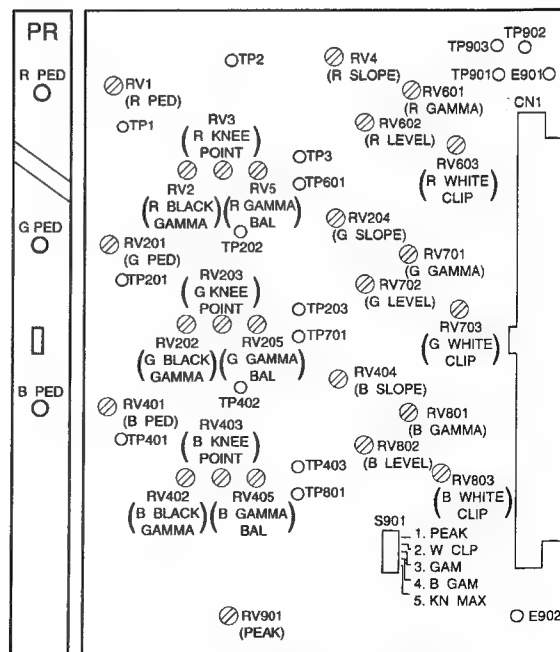
- S100-2 (RET/VF)

This switch selects an output signal at the MONITOR OUT connector (BNC) on the left side of the camera.

Factory-setting is "VF".

VF : A signal selected with S1

RET: RET VIDEO signal



PR-197A/197B BOARD (COMPONENT SIDE)

- S200-1 (ZEBRA 70 % ON/OFF)
- S200-2 (ZEBRA 100 % ON/OFF)

When S200-1 is set to "ON", a zebra pattern indicates areas of picture where the video level is about 70 IRE units (for BVP-750), or 490 mV (for BVP-750P).

When S200-2 is set to "ON", a zebra pattern indicates areas where the video level is about 100 IRE units and above (for BVP-750), or 700 mV and above (for BVP-750P).

Factory-setting is "OFF".

- S400 (I ON/OFF) for BVP-750  
(U ON/OFF) for BVP-750P
- S401 (Q ON/OFF) for BVP-750  
(V ON/OFF) for BVP-750P

These switches are used for the VBS signal adjustment.  
Factory-setting is "ON".

- S600 (Y(CCU)/VBS(CCU))

When the camera is connected to the CCU and makes the VBS signal to be output at the VBS connector on the left side of the camera, set this switch to "VBS(CCU)".

Factory-setting is "Y(CCU)".

- S601-1 (CCU CALL ON/OFF)

When the switch is set to "ON", the TALLY lamps on the camera and viewfinder will light up (when they are not lit) or off (when they are lit) by pressing a CALL button of the MSU, RCP and so on to call a camera operator.

Factory-setting is "ON".

- S601-2 (CHU CALL ON/OFF)

When the switch is set to "ON", the TALLY lamps of the camera and viewfinder will light up (when they are not lit) or off (when they are lit) by pressing the CALL button on the camera rear panel.

Factory-setting is "OFF".

#### AT-90 board

- S1 (MODE)

This is a switch for an optional circuit. Always set to "0".

- S2: Not used

- S3 (REMOTE MODE 1 CMD/ISR)

- S4 (REMOTE MODE 2 CMD/ISR)

Used to select mode for the REMOTE connector on the left side of the camera.

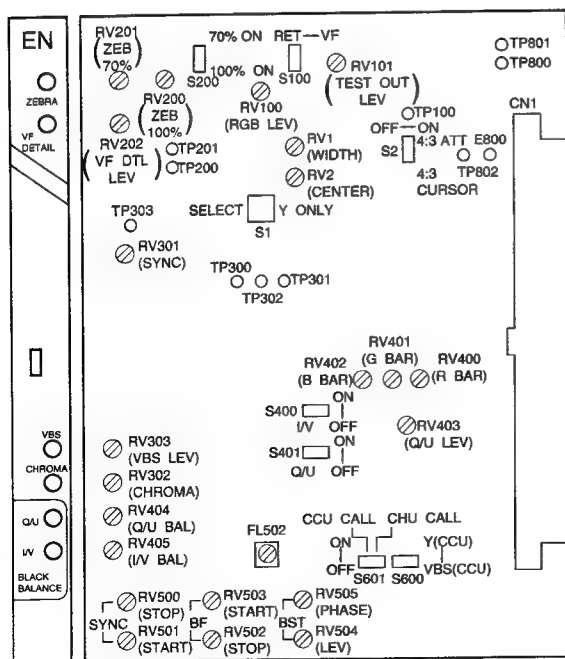
CMD : Camera control mode

ISR : Self-diagnosis mode when the CCU mal-functions. Using this mode, connect a personal computer to the CCU.

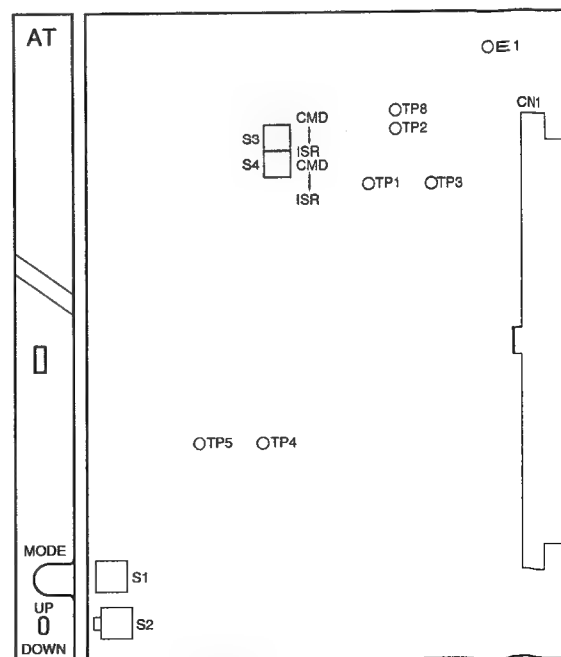
Be sure to set S3 and S4 to the same mode.

Factory-setting is "CMD".

\* ISR = Interactive Status Report System



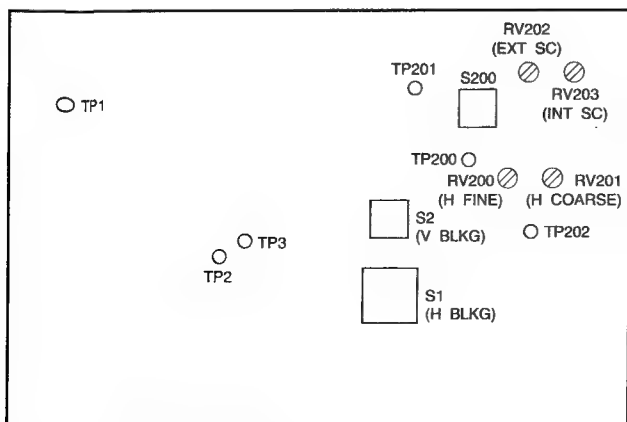
EN-120A/120B/120P BOARD (COMPONENT SIDE)



AT-90 BOARD (COMPONENT SIDE)

## SG-224/224P board

- **S1 (H BLANKING)**  
This switch adjusts the H blanking width.  
It has been adjusted to  $10.9 \pm 2 \mu\text{s}$  at the factory.
- **S2 (V BLANKING 19/20/21H) ••• BVP-750 only**  
This switch selects the V blanking width.  
Factory-setting is "20H".
- **S200 (SC PHASE 0°/180°)**  
RV202 (EXT SC PHASE)  
RV203 (INT SC PHASE)  
This switch inverts the SC (subcarrier) phase by 180 degrees.  
RV202 and RV203 are used for fine adjustment between 0 and 180 degrees.



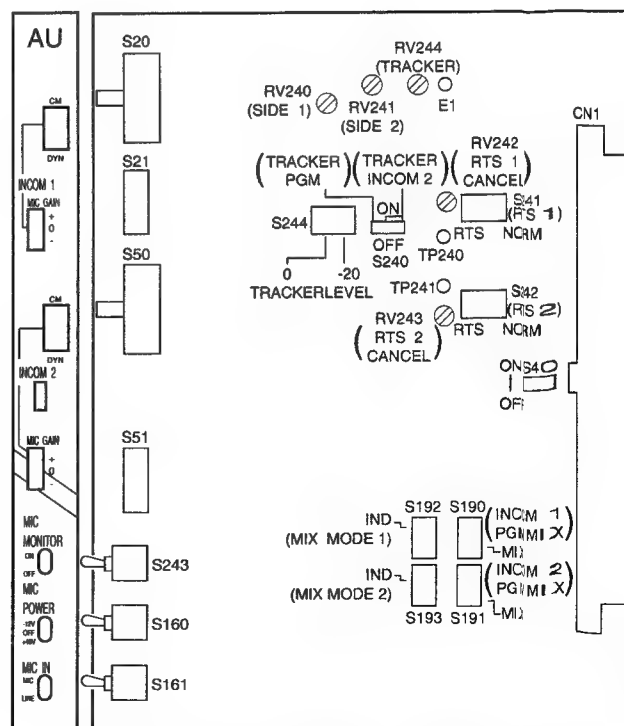
**SG-224/224P BOARD (COMPONENT SIDE)**

## AU-199/199P board

- **S20 (INCOM 1 CARBON/DYNAMIC)**
- **S50 (INCOM 2 CARBON/DYNAMIC)**  
Set these switches according to a microphone type of the headset connected to the INCOM 1 (or 2) connector.  
DYN: Dynamic microphone  
CM : Carbon microphone  
Factory-setting is "CM" (CARBON).
- **S21 (INCOM 1 MIC GAIN +/0/-)**
- **S51 (INCOM 2 MIC GAIN +/0/-)**  
Used to set the INCOM 1 (or 2) audio level output to the CCU. Selectable gains are +6 dBu, 0 dBu and -6 dBu. Set according to use.  
Factory-setting is "0" (0 dBu). (0 dBu=0.775 Vrms)
- **S40-1 (INCOM 1 MIC UNBALANCE)**
- **S40-2 (INCOM 2 MIC UNBALANCE)**  
When a headset with a dynamic microphone is connected to the INCOM 1 (or 2) connector, and the connection is unbalanced, the intercom line may hum. To improve this, set S40-1 (or S40-2) to "ON".  
Factory-setting is "OFF".
- **S160 (MIC POWER +48 V/OFF/+12 V)**  
Set this switch according to a program microphone in use.  
+48 V: PHANTOM 48 V microphone  
+12 V: AB POWERING 12 V microphone  
Factory-setting is "OFF".
- **S161 (MIC/LINE)**  
Set this switch to "LINE" when a line-level signal source is connected to the MIC 1 and 2 connectors at the rear of the unit. An input level of the signal is -20 dBu.  
Factory-setting is "MIC".
- **S190 (INCOM 1 PGM MIX) ••• BVP-750 only**
- **S191 (INCOM 2 PGM MIX) ••• BVP-750 only**  
When S190 (or S191) is set to "MIX" (bottom side of switch), the INCOM 1 (or 2) and PGM 1 (or 2) of INCOM 1 (or 2) connector on the rear panel are mixed each other, and mixed signal is output as INCOM 1 (or 2) and PGM1 (or 2) outputs. When set to up side, INCOM 1 (or 2) and PGM 1 (or 2) are independently output.  
These switches are factory-set to up side.

- S192 (MIX MODE 1) ••• BVP-750 only
- S193 (MIX MODE 2) ••• BVP-750 only  
When S192 (or S193) is set to "IND" (up side of switch) with S190 (or S191) set to "MIX", the output levels of INCOM and PGM are adjusted using the INCOM and PGM volume controls on the rear panel respectively. When set to bottom side, the PGM control adjusts a mixed ratio of INCOM and PGM, and the INCOM control adjusts the mixed signal output level.  
Factory-setting is "IND".
- S240-1 (TRACKER PGM ON/OFF)  
Set this switch to "ON" to mix the PGM (program audio) with the TRACKER RECEIVE output.  
Factory-setting is "OFF".
- S240-2 (TRACKER INCOM 2 ON/OFF)  
Set this switch to "ON" to mix the INCOM 2 audio signal with the TRACKER RECEIVE output. Normally set S240-2, S240-3 and S240-4 to the same mode.  
Factory-setting is "OFF".
- S240-3 (TRACKER INCOM 2 ON/OFF)  
Set this switch to "ON" to mix the TRACKER audio signal with the INCOM 2 MIC output. Normally set S240-2, S240-3 and S240-4 to the same mode.  
Factory-setting is "OFF".
- S240-4 (TRACKER INCOM 2 ON/OFF)  
Set this switch to "ON" to mix the TRACKER audio signal with the INCOM 2 RECEIVE output. Normally set S240-2, S240-3 and S240-4 to the same mode.  
Factory-setting is "OFF".
- S241 (RTS 1 RTS/NORM)
- S242 (RTS 2 RTS/NORM)  
Not used. Always set to "NORM" (NORMAL).

- S243 (MIC MONITOR ON/OFF)  
When this switch is set to "ON", a program microphone input is mixed with the INCOM 1 output at the INTERCOM 1 connector and is able to be monitored.  
Factory-setting is "OFF".
- S244 (TRACKER TALK LEVEL 0 dBu/-20 dBu)  
Used to set the input level at the TRACKER connector to 0 dBu or -20 dBu.  
Factory-setting is "0 dBu". (0 dBu = 0.755 Vrms)



**AU-199/199P BOARD (COMPONENT SIDE)**

## MD-99 board

- S1 (R ON/OFF)
- S2 (G ON/OFF)
- S3 (B ON/OFF)

Use these switches to change the combination of G, R and B signals entering the Y, R-Y and B-Y matrix circuit for board adjustment.

| Adj. Point      | S1  | S2  | S3 |
|-----------------|-----|-----|----|
| RV101 (Y REF)   | ON  | ON  | ON |
| RV201 (R-Y REF) | OFF | ON  | ON |
| RV301 (B-Y REF) | OFF | OFF | ON |

Factory-setting is all "ON".

### • S4 (PROMPTER DIRECTION SELECT)

This switch selects the direction of the prompter signal to be transmitted between the camera and CCU.

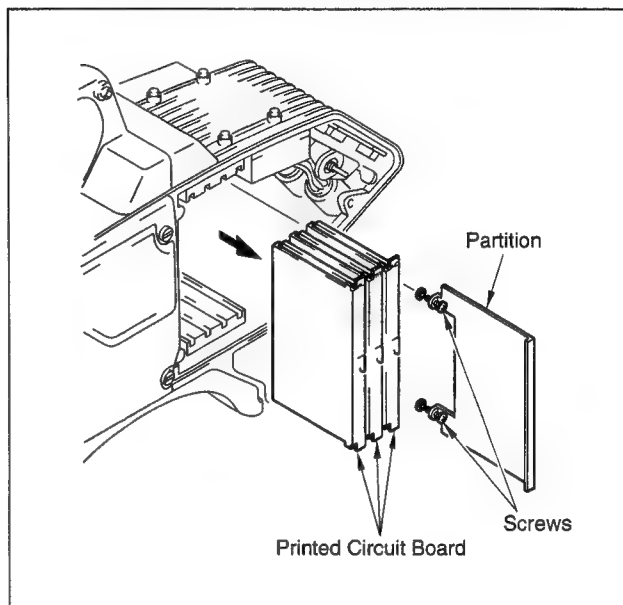
**CCU→CAM :** The prompter signal is transmitted from the CCU to the camera and is then output at the PROMPT connector (BNC) of the camera.

**CAM→CCU :** The prompter signal is input at the camera PROMPT connector and is transmitted to the CCU.

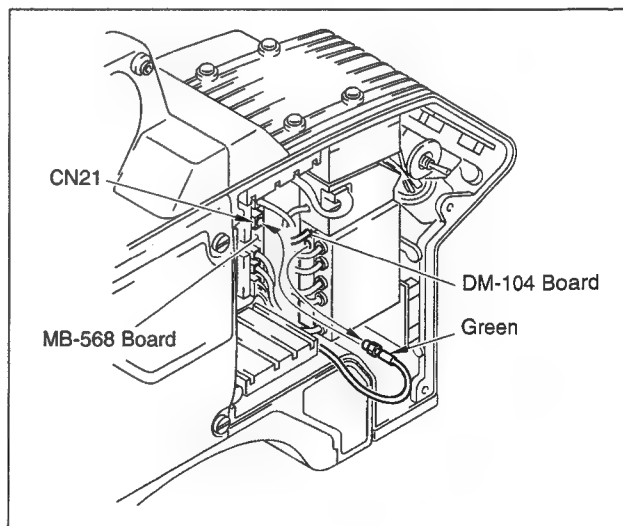
Factory-setting is "CCU→CAM".

**Note:** when changing the switch setting of S4, be sure to take the following action.

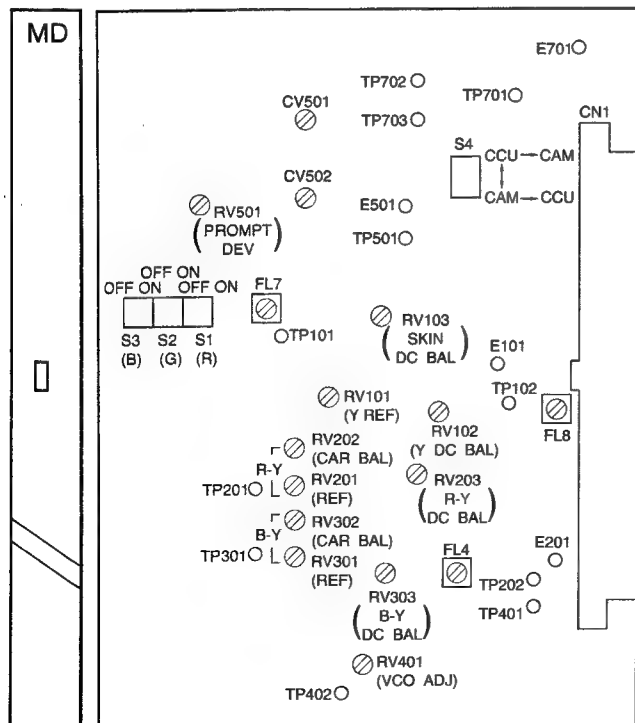
1. Open the side panel of camera adaptor.
2. Pull out the three printed circuit boards, AU, TR and MD. Loosen the two screws securing a partition.



3. Unplug the coaxial connector (green) at the "P" position of the DM-104 board.
4. Reconnect it to CN21 on the MB-568 board as shown in the figure. Insert until it clicks.



The coaxial connector has been connected to the DM-104 board ("P" position) at the factory.



MD-99 BOARD (COMPONENT SIDE)



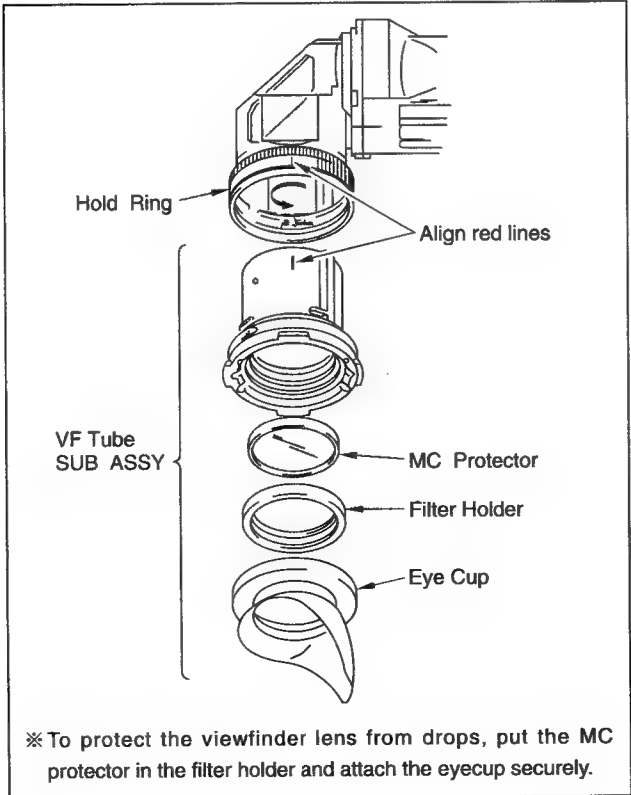
1-6. PERIPHERAL EQUIPMENTS AND ACCESSORIES

- Camera Control Unit  
CCU-700/700P
- Camera Command Network Unit  
CNU-700
- Master Setup Unit  
MSU-700
- Video Selector  
VCS-700
- Remote Control Panel  
RCP-700/701  
RCP-720/721  
RCP-740/741
- CCD Unit  
OHB-750/750P (FIT/4:3)  
OHB-750W/750WP (FIT/16:9)
- Electronic Viewfinder  
BVF-55/55CE (5-inch/B/W)
- Camera Adaptor  
CA-753 (Interface adaptor for BVV-5/CA-3A)  
CA-3A
- Video Cassette Recorder  
BVV-5/5PS
- CCA-5 Cable  
CCA-5-3 (3 m)  
CCA-5-10 (10 m)
- Triaxial Cable  
Connection cable between BVP and CCU
- Long Triax Unit  
BKP-7510
- Microphone Holder  
CAC-12
- Camera Rain Cover  
LCR-1
- Carrying Case  
LC-304-SFT (soft case)

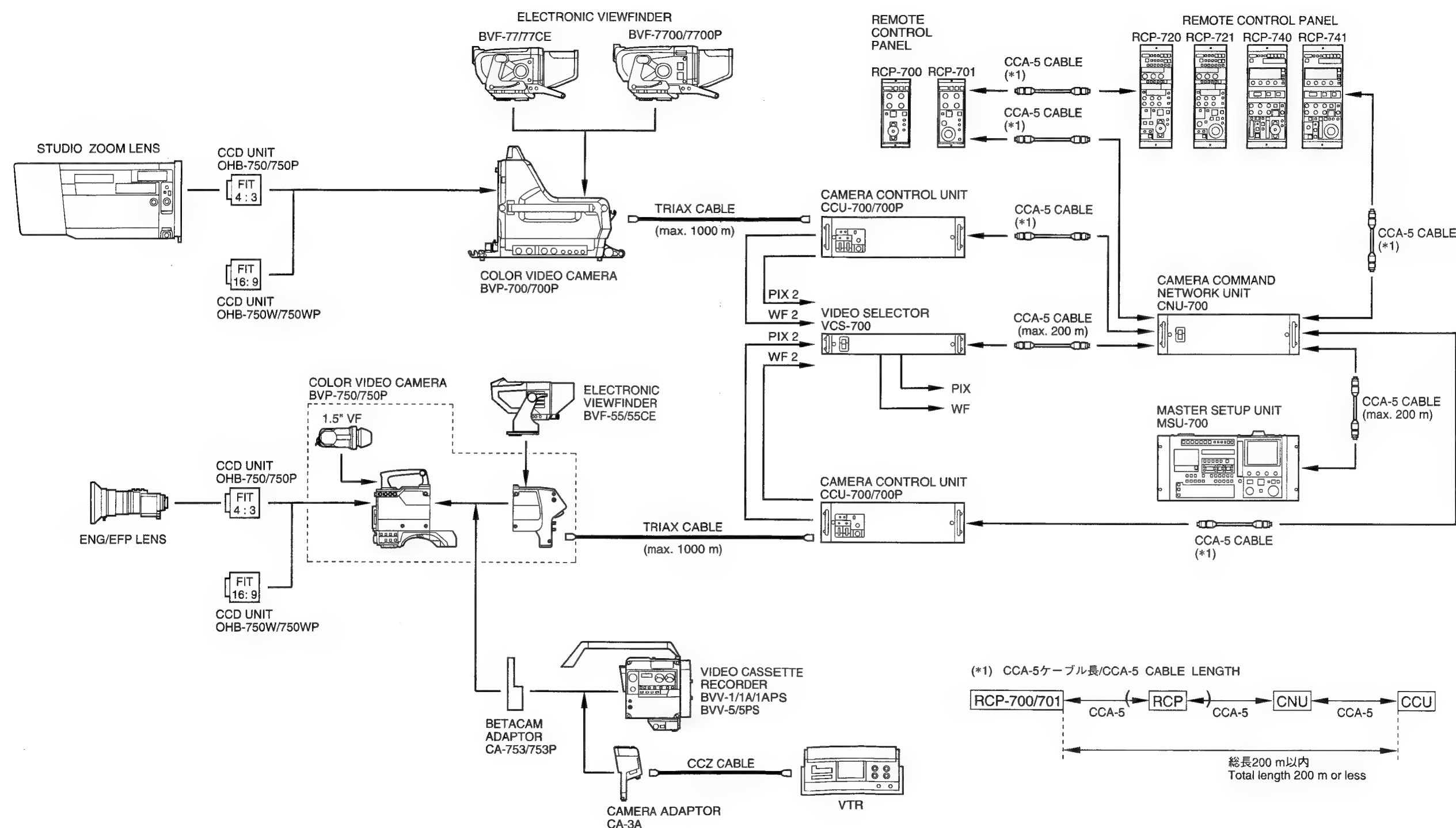
1-7. ACCESSORIES FOR VIEWFINDER

The following accessories are available separately for the supplied viewfinder. Please order as necessary.

- VF Rotation Bracket: BKW-401  
By fitting the BKW-401 to the camera, you can rotate the viewfinder out of the way so that your right leg does not hit the viewfinder while you are carrying the camera. And you can install the CCD unit OHB into the camera with the viewfinder attached.
- Fog-proof Filter (Sony Part No. 1-547-341-11)  
Use in place of the MC protector shown in the figure.
- Lens Assembly for Aged Eyes (Sony Part No. A-8262-537-A)
- Lens Assembly for Low Power (Sony Part No. A-8262-538-A)
- Lens Assembly (standard magnification with special compensation for aberration) (Sony Part No. A-8267-737-A)
- High Performance (3X) Lens Assembly (Sony Part No. A-8314-798-A)  
Use in place of the VF tube sub assy shown in the figure.
- VF Slide Guide for Left Eye (Sony Part No. A-7612-381-A)



1-8. INSTANCE OF SYSTEM CONFIGURATION



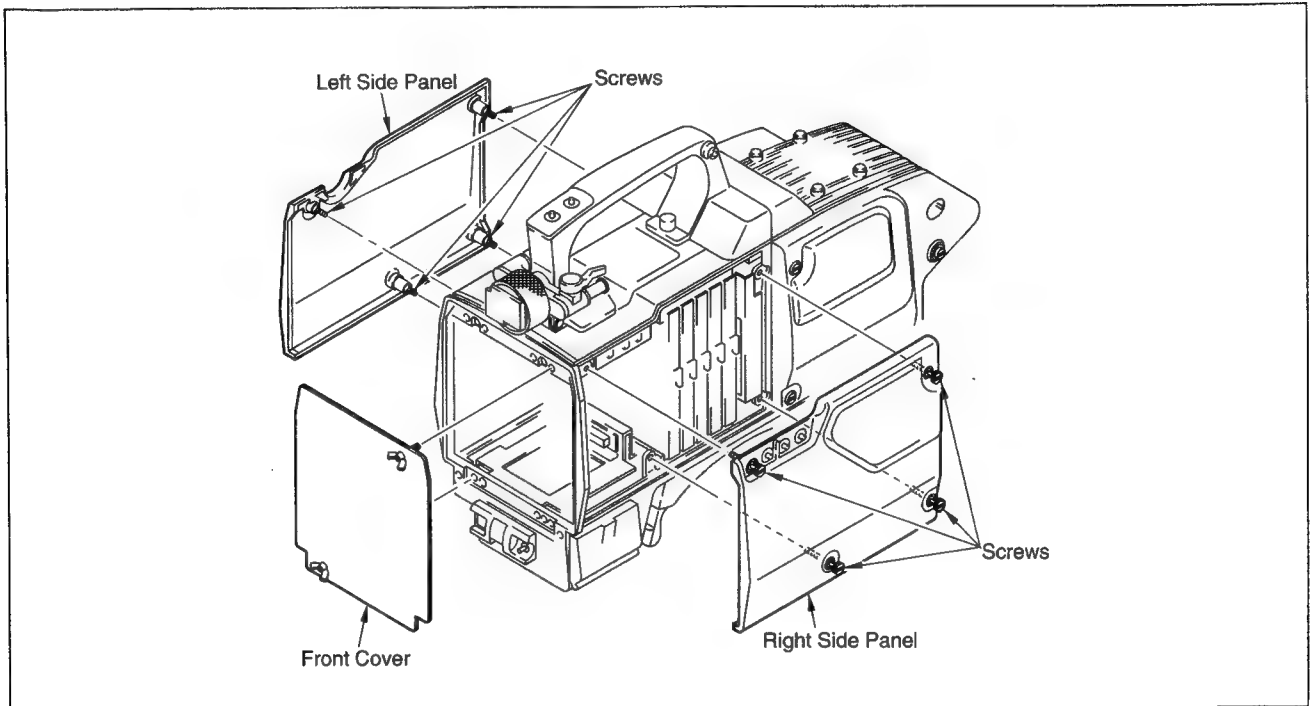
## SECTION 2

### REPLACEMENT OF MAIN PART

#### 2-1. CABINET REMOVAL

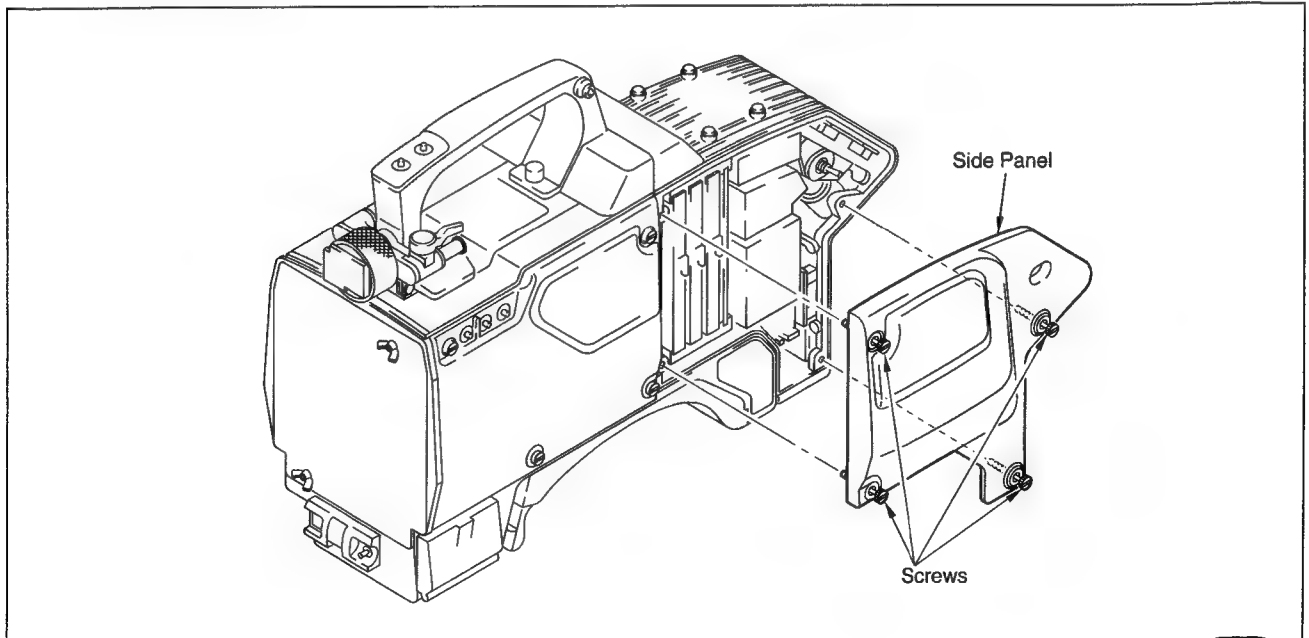
##### 2-1-1. Camera Head

To remove the right and left side panels, loosen the four screws respectively.  
To remove the front cover, loosen the two screws.



##### 2-1-2. Camera Adaptor

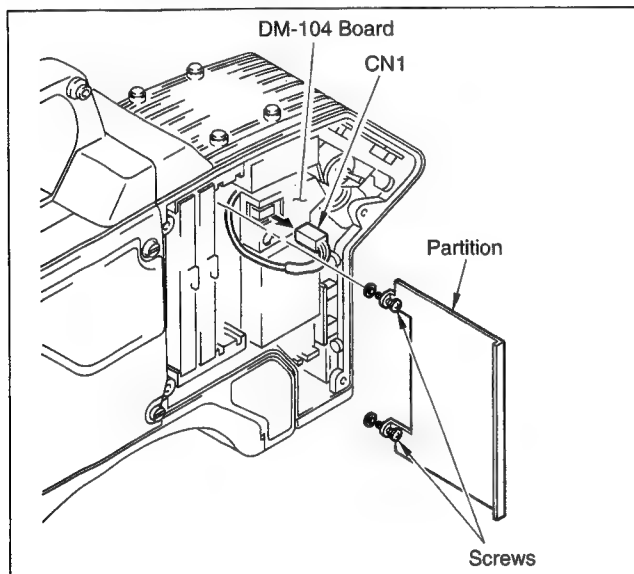
Loosen the four screws to remove the right side panel.



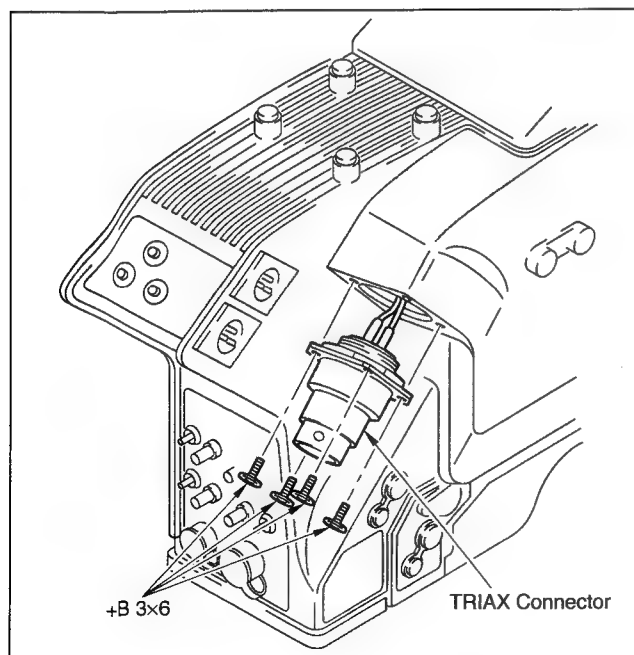
## 2-2. REPLACEMENT OF EXTERNAL CONNECTORS

### 2-2-1. TRIAX Connector

1. Remove the side panel of the camera adaptor referring to "Section 2-1. CABINET REMOVAL".
2. Disconnect the connector CN1 from the DM-104 board.
3. Pull out the MD-99 board.
4. Loosen the two screws to remove the partition.



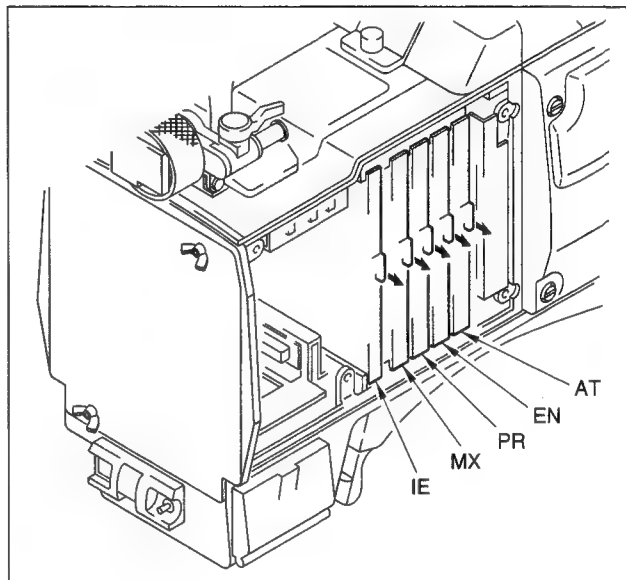
5. Remove the four screws and remove the TRIAX connector.



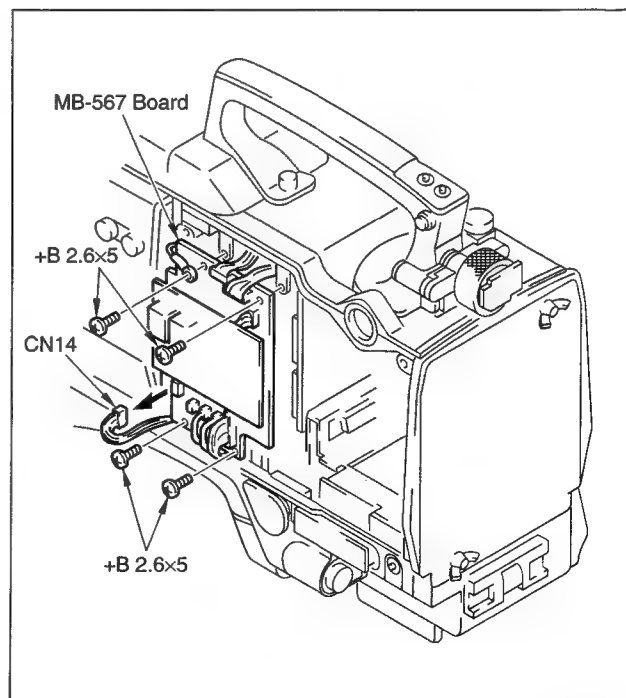
6. Install a new connector in the reverse procedures of removal.

### 2-2-2. Lens Connector

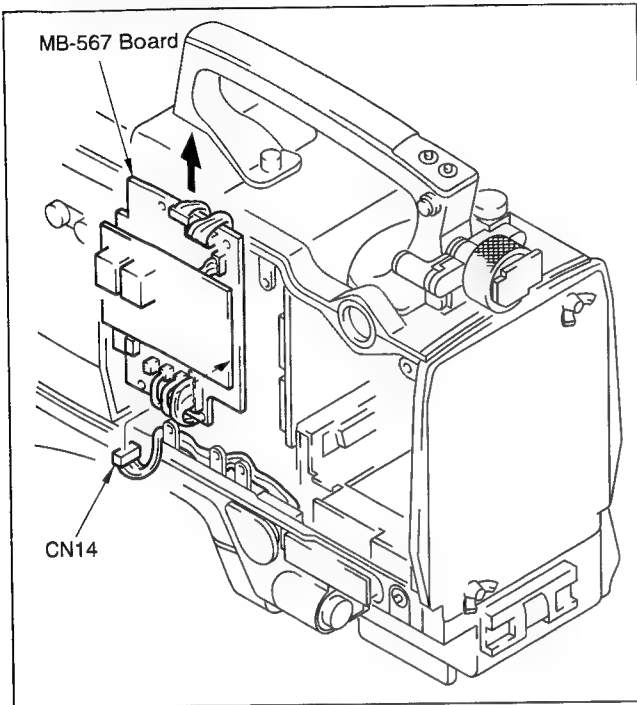
1. Remove the left/right side panels of the camera head referring to "Section 2-1. CABINET REMOVAL".
2. Pull out the five printed circuit boards shown in the figure.



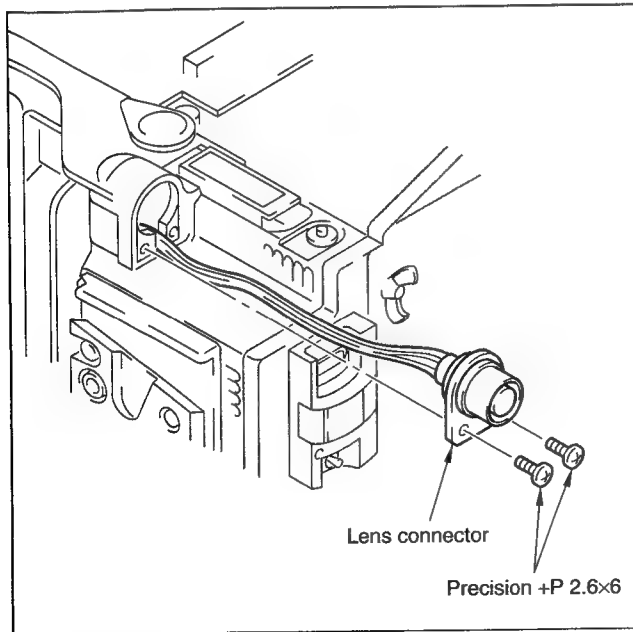
3. Remove the four screws and pull the MB-567 board toward you.
4. Disconnect the connector CN14 from the MB-567 board.



5. Lifting up the MB-567 board, push the connector removed in Step 4 in the inside through a gap between the unit and the lower end of the board.



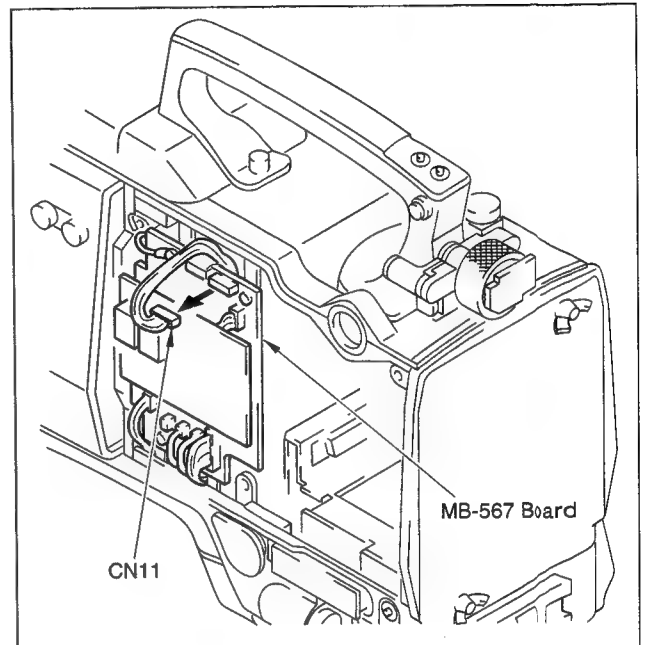
6. Remove the two precision screws and remove the lens connector with harness.



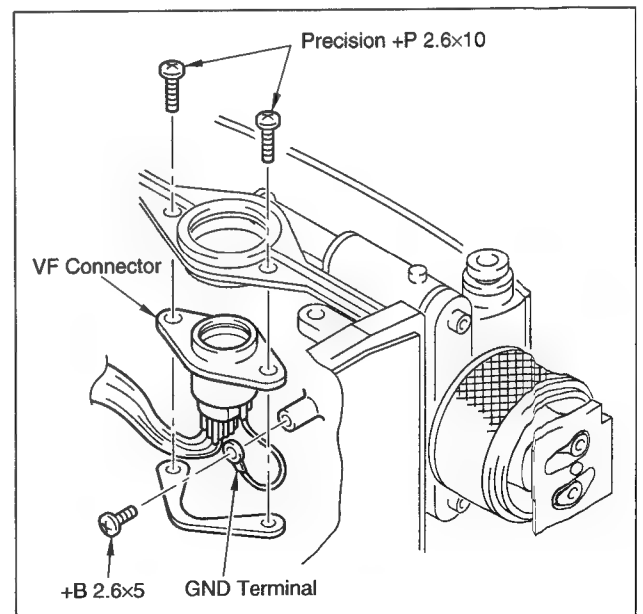
7. Install a new connector in the reverse procedures of removal.

### 2-2-3. VF Connector

1. Remove the left side panel of the camera head referring to "Section 2-1. CABINET REMOVAL".
2. Disconnect the connector CN11 from the MB-567 board.



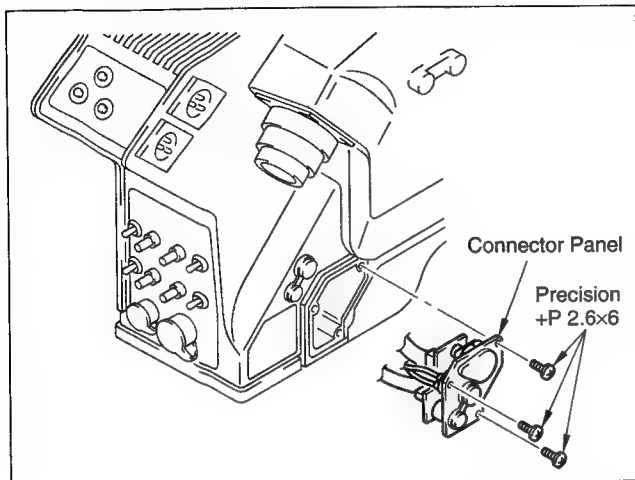
3. Remove the screw securing the GND terminal.
4. Remove the two precision screws securing the VF connector to the unit and remove the VF connector with harness.



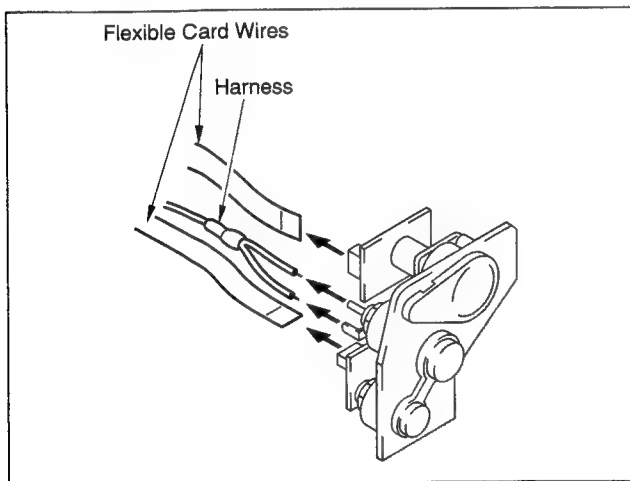
5. Install a new connector in the reverse procedures of removal.

#### 2-2-4. REMOTE/VBS/RET CONT Connectors

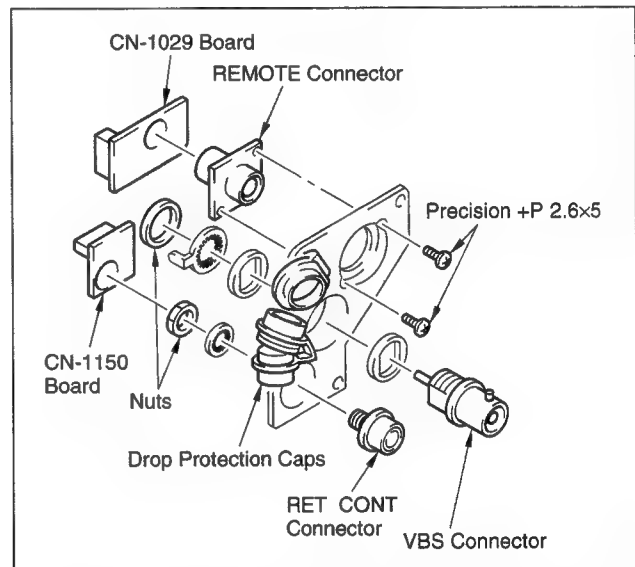
1. Remove the three precision screws and pull out the connector panel.



2. Disconnect the two flexible card wires and unsolder the harness of VBS connector.



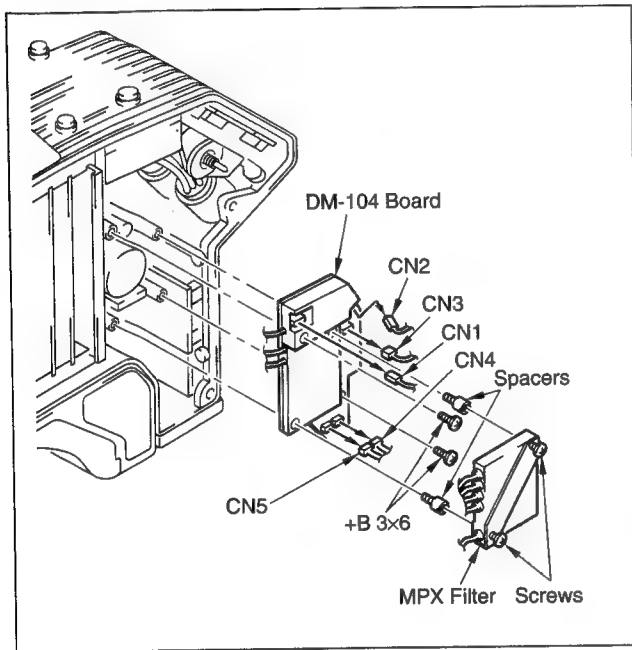
3. Uncap the drop protection caps for each connector.
4. To remove the REMOTE connector, remove the two precision screws and remove the REMOTE connector from the CN-1029 board.
5. To remove the VBS connector remove the nut securing the VBS connector.
6. To remove the RET CONT connector, remove the nut securing the RET CONT connector and remove the CN-1150 board.



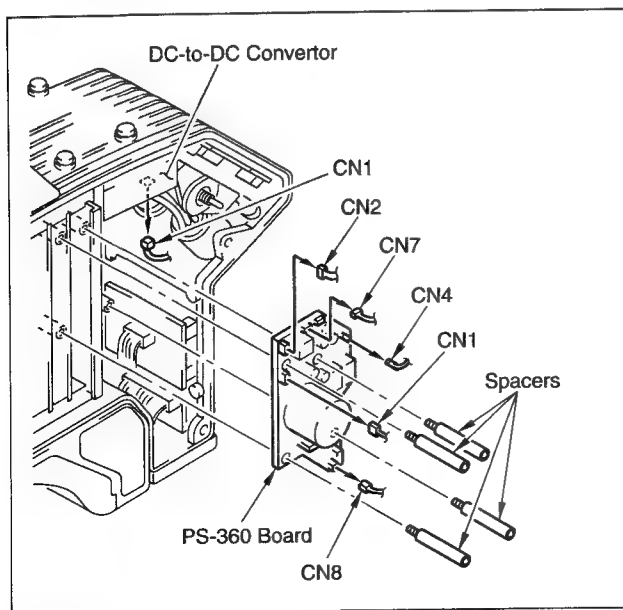
7. Install a new connector in the reverse procedures of removal.

### 2-2-5. PROMPT/DC OUT Connectors

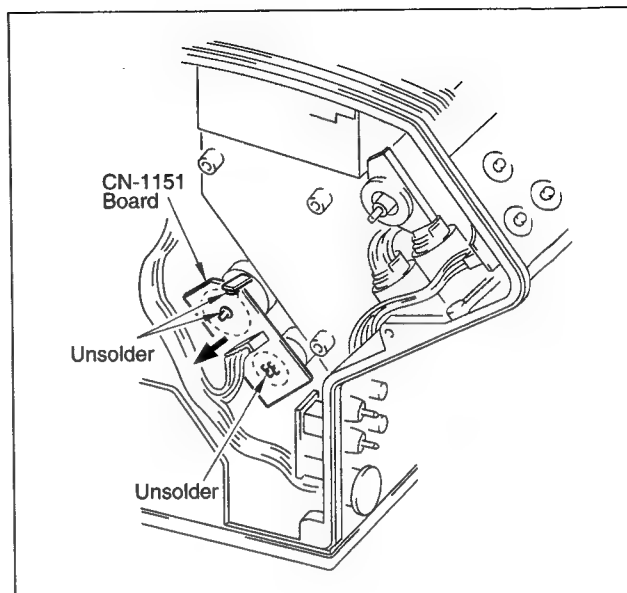
1. Remove the side panel of the camera adaptor referring to "Section 2-1. CABINET REMOVAL".
2. Loosen the two screws to remove the MPX filter.
3. Disconnect the five connectors CN1, CN2, CN3, CN4, and CN5 from the DM-104 board.
4. Remove the two spacers and two screws and remove the DM-104 board.



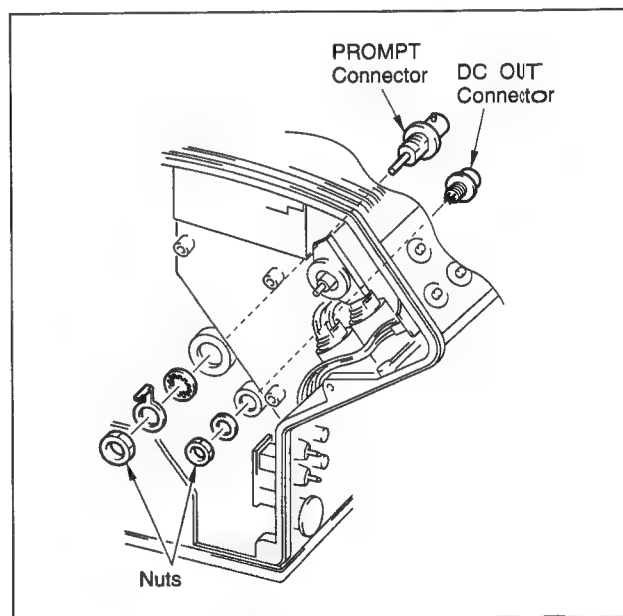
5. Disconnect the six connectors CN1, CN2, CN3, CN4, CN7 and CN8 from the PS-360 board.
6. Disconnect the connector CN1 from the DC-to-DC converter.
7. Disconnect the four spacers and remove the PS-360 board.



8. Unsolder and remove the CN-1151 board.



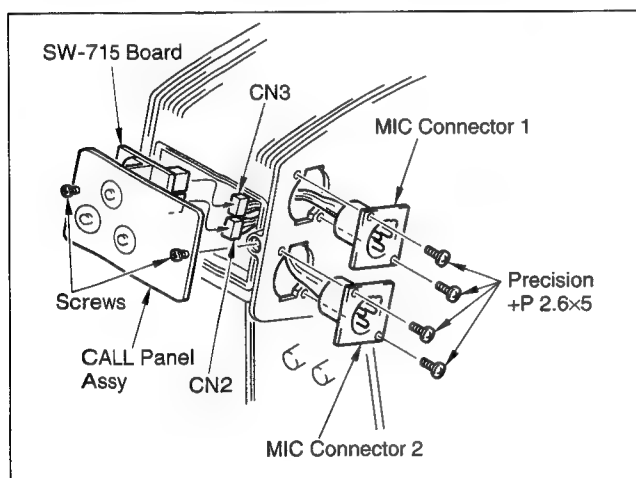
9. Remove the nut respectively to remove the PROMPT connector and DC OUT connector.



10. Install a new connector in the reverse procedures of removal.

## 2-2-6. MIC Connector

1. Loosen the two screws to remove the CALL panel assembly.
2. Disconnect the two connectors CN2 and CN3 from the SW-715 board.
3. Remove the two precision screws respectively to remove the MIC connector with harness.

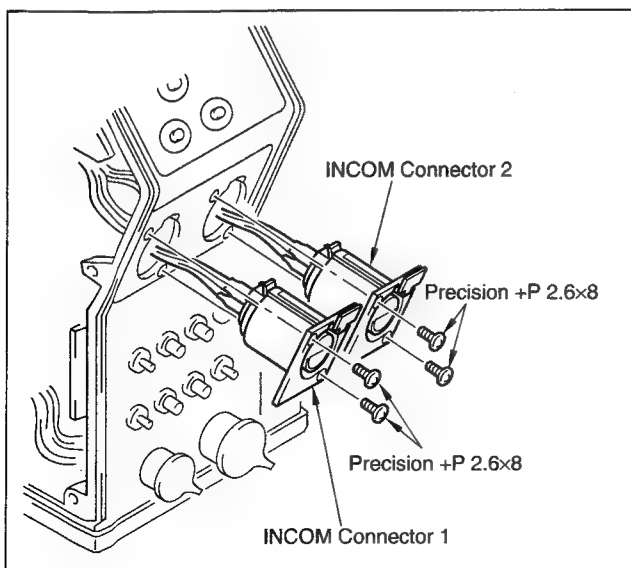


4. Unsolder the MIC connector.
5. Install a new connector in the reverse procedures of removal.

## 2-2-7. INCOM Connector

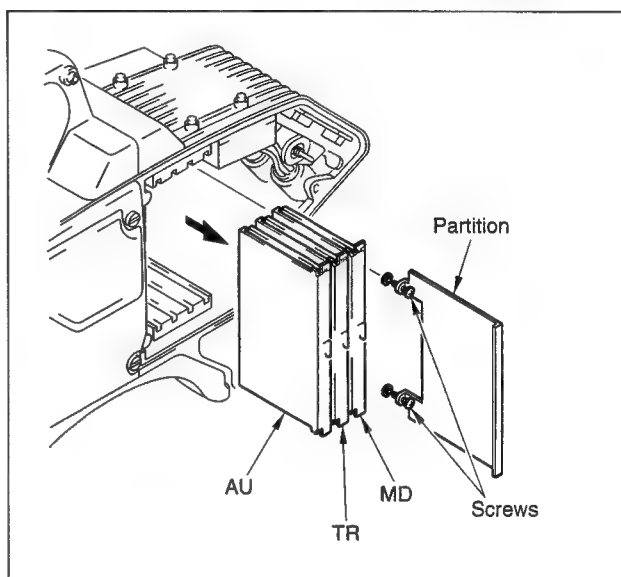
### Replacement of INCOM connector alone

Remove the two precision screws and pull out the INCOM connector to be replaced. Then unsolder it.

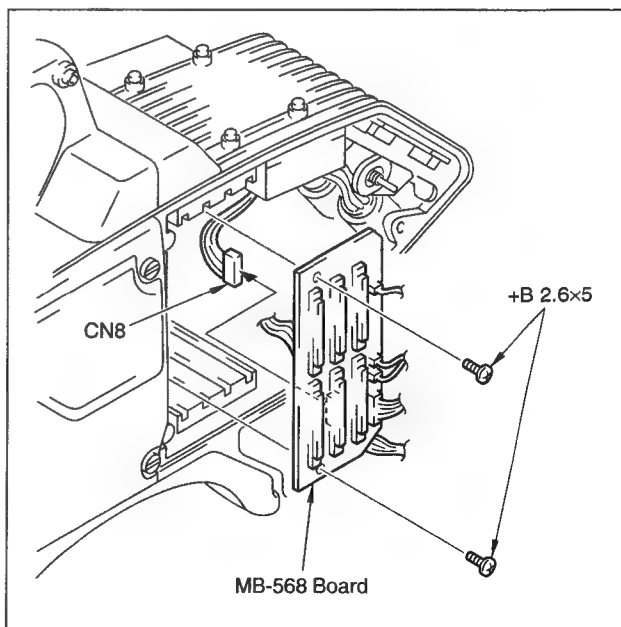


### Replacement of INCOM connector with harness

1. Carry out steps 1 to 4 of replacement procedure for the PROMPT/DC OUT connector.
2. Pull out the three printed circuit boards as shown in the figure.
3. Loosen the two screws securing the partition.

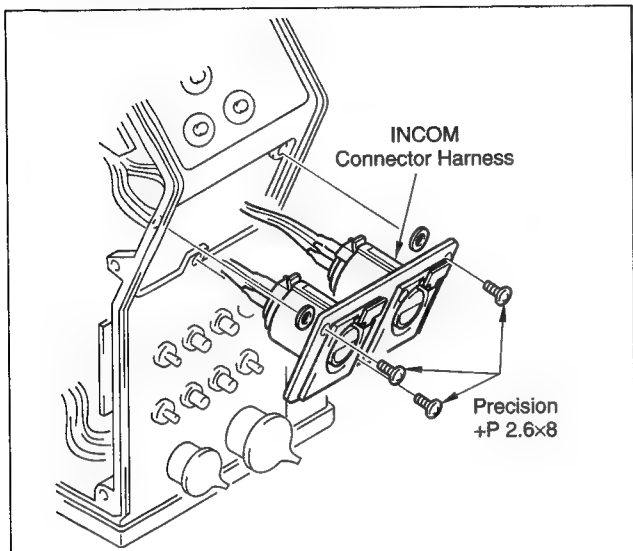


4. Remove the two screws and remove the MB-568 board.
5. Disconnect the connector CN8 from the MB-568 board.





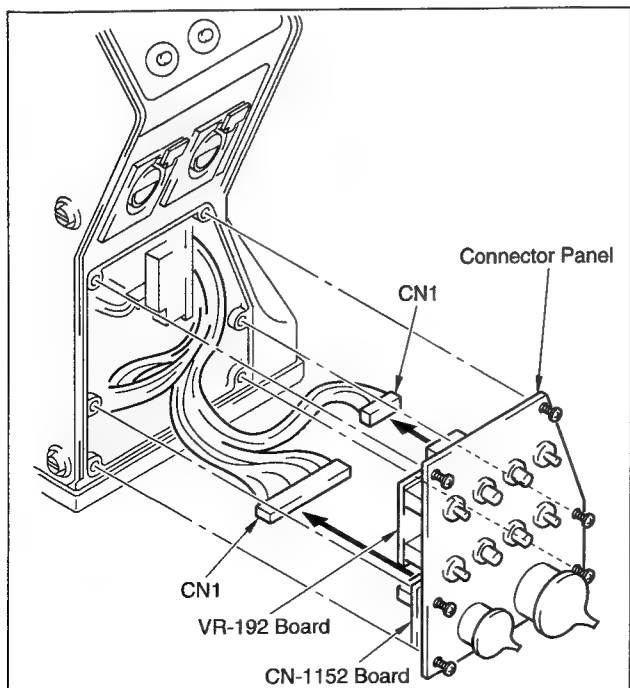
- Remove the three precision screws and remove the INCOM connector harness with the connector panel attached.



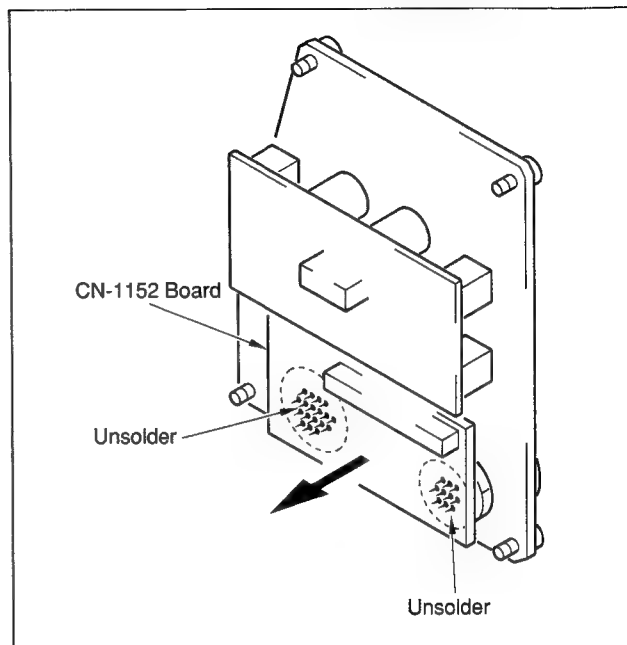
- Install a new connector in the reverse procedures of removal.

## 2-2-8. TRACKER/EXT IO Connector

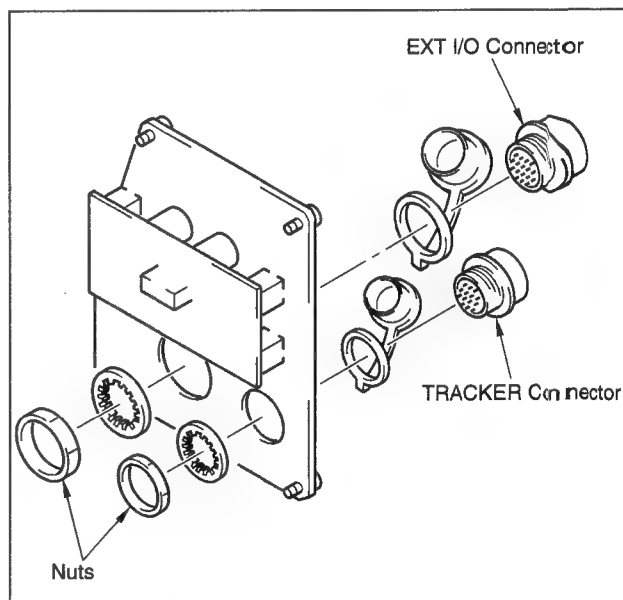
- Loosen the six screws and remove the connector panel.
- Disconnect the connector CN1 from the VR-192 board.
- Disconnect the connector CN1 from the CN-1152 board.



- Unsolder and remove the CN-1152 board.



- Remove the nut respectively to remove the TRACKER connector and EXT I/O connector.

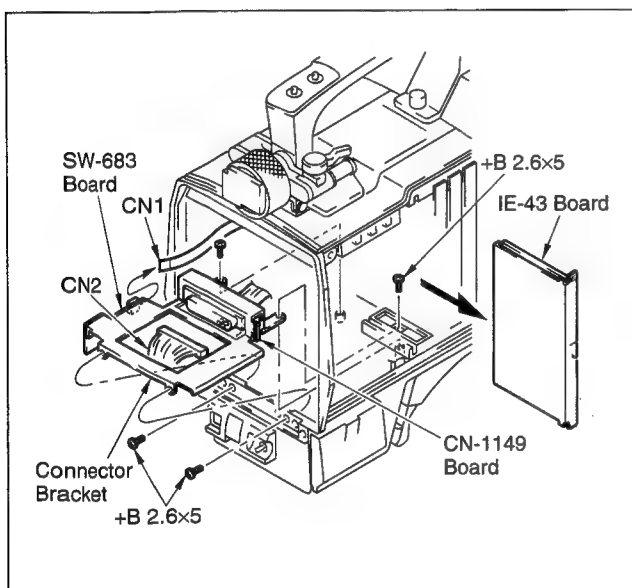


- Install a new connector in the reverse procedures of removal.

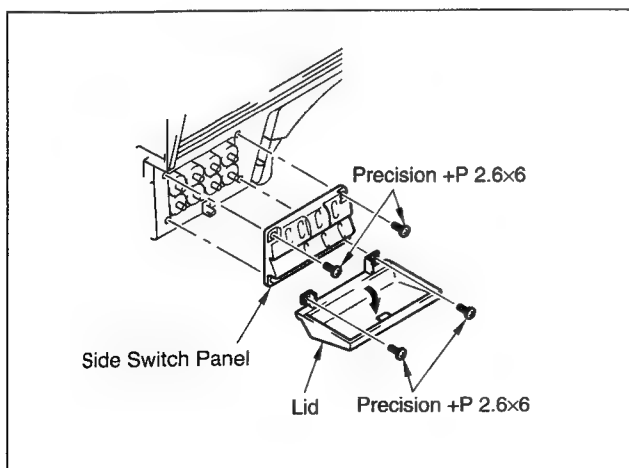
## 2-3. REPLACEMENT OF FUNCTION SWITCHES/CONTROLS

### 2-3-1. Side Switch Panel Block

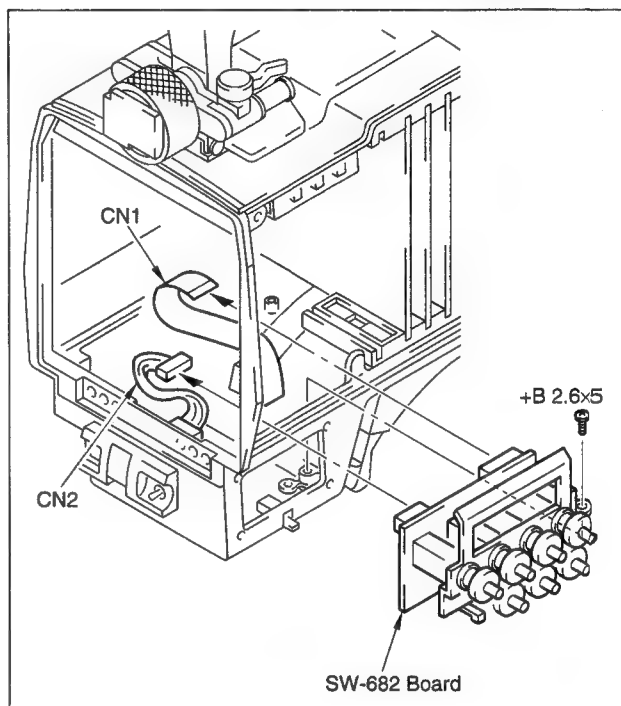
1. Remove the front cover and right side panel of the camera head referring to "Section 2-1. CABINET REMOVAL".
2. Pull out the IE-43 board.
3. Remove the four screws securing the connector bracket and remove the connector bracket.
4. Disconnect the connector CN2 from the CN-1149 board.
5. Disconnect the connector CN1 from the SW-683 board.



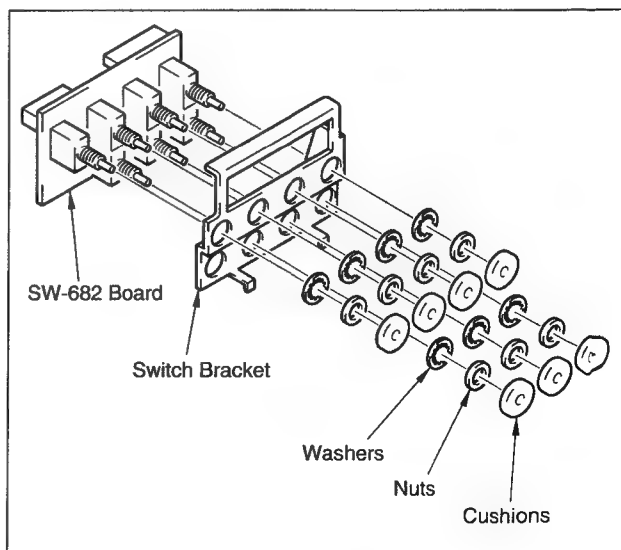
6. Open the lid. Remove the four screws and remove the side switch panel.



7. Disconnect the connector CN1 and CN2 from the SW-682 board.
8. Remove the screw and remove the SW-682 board.



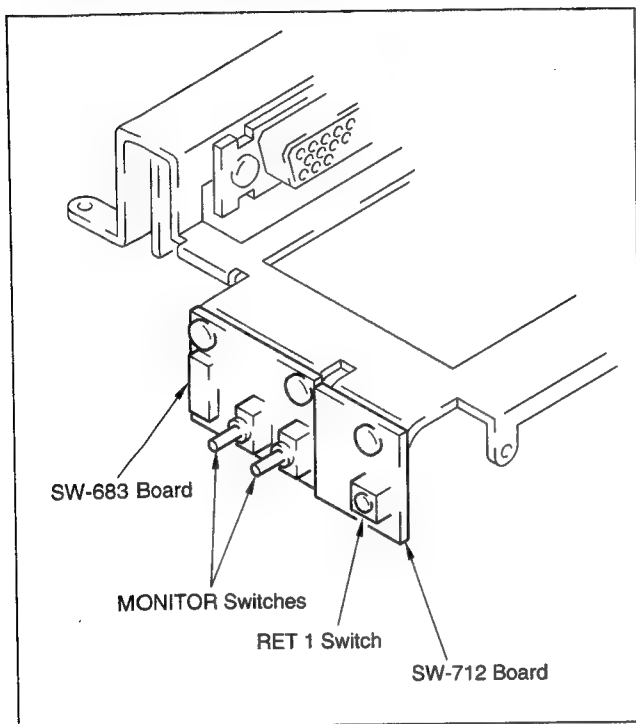
9. Remove the seven cushions, seven nuts and seven washers, and remove the SW-682 board from the switch bracket.
10. Unsolder and remove a switch to be replaced.



11. Install a new switch in the reverse procedures of removal.

### 2-3-2. MONITOR/RET 1 Switches

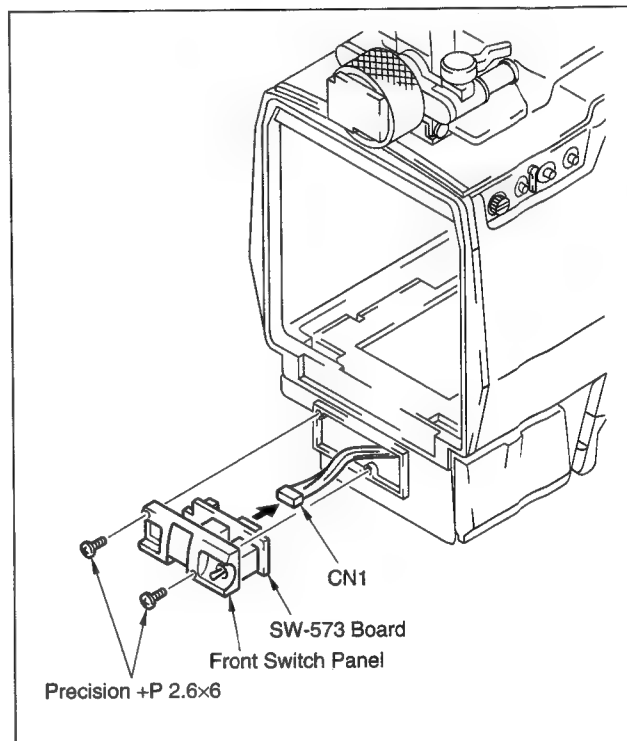
1. Carry out steps 1 to 5 of replacement procedure for the switches in the side panel block.
2. Unsolder and remove a switch to be replaced.



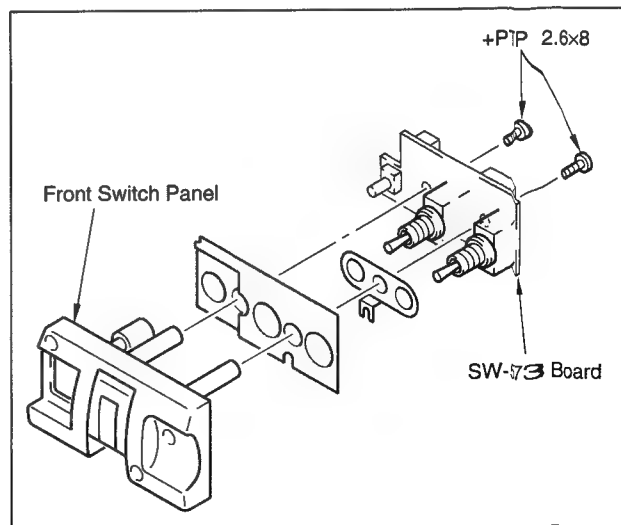
3. Install a new switch in the reverse procedures of removal.

### 2-3-3. Front Switch Panel Block

1. Remove the front cover of the camera head referring to "Section 2-1. CABINET REMOVAL".
2. Remove the two precision screws and remove the front switch panel.
3. Disconnect the connector CN1 from the SW-573 board.



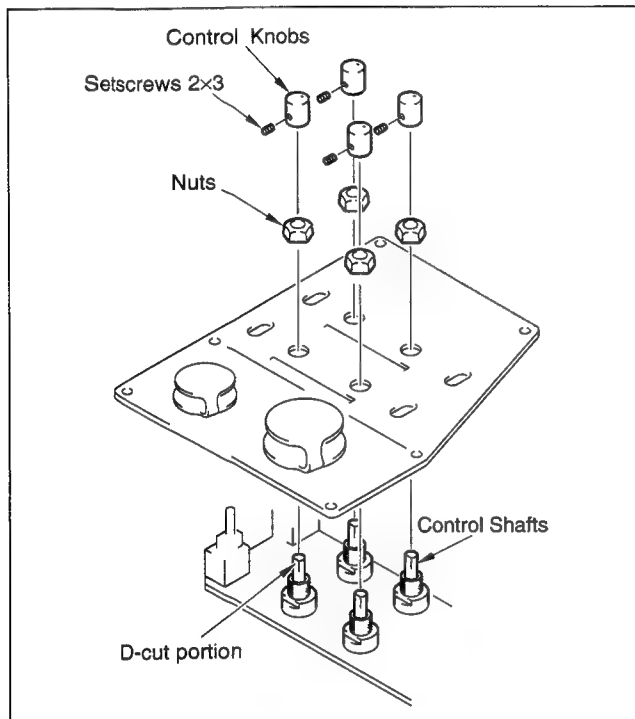
4. Remove the two screws and remove the SW-573 board from the front switch panel.
5. Unsolder and remove a switch to be replaced.



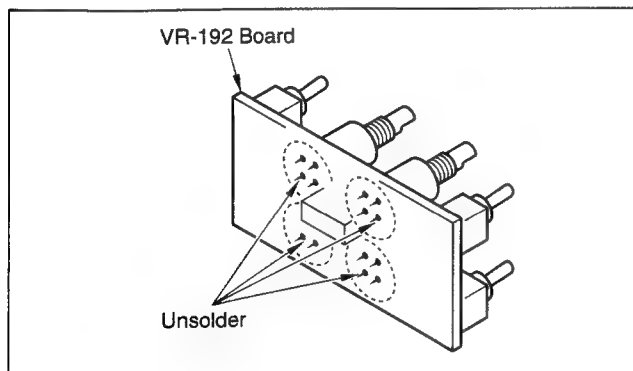
6. Install a new switch in the reverse procedures of removal.

#### 2-3-4. INCOM Controls

1. Carry out steps 1 to 3 of replacement procedure for the TRACKER and EXT I/O connectors at the rear referring to Section 2-2-8.
2. Remove the setscrew respectively to remove the four control knobs.
3. Remove the four nuts.



4. Unsolder and remove a control to be replaced.



5. Install a new control in the reverse procedures of removal.

#### Notes in installation

- When tightening the nut, be sure to keep the following tightening torque.

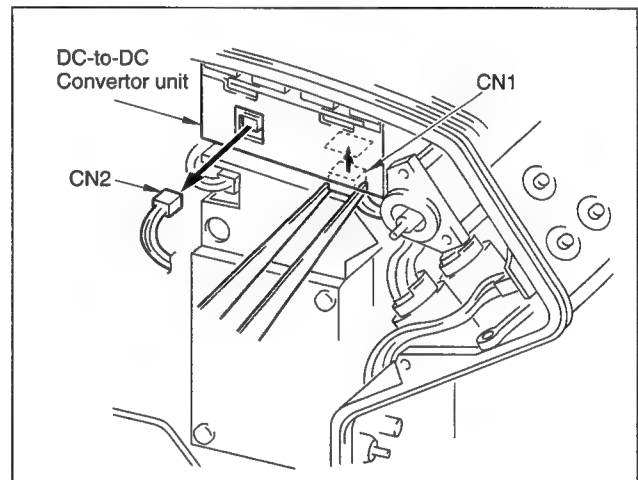
Tightening torque:  $0.3 \pm 0.02 \text{ N} \cdot \text{m}$   
 $(3.0 \pm 0.2 \text{ kgf} \cdot \text{cm})$

- Before inserting the control knob, turn the control shaft clockwise until the D-cut portion of the shaft turns just down.

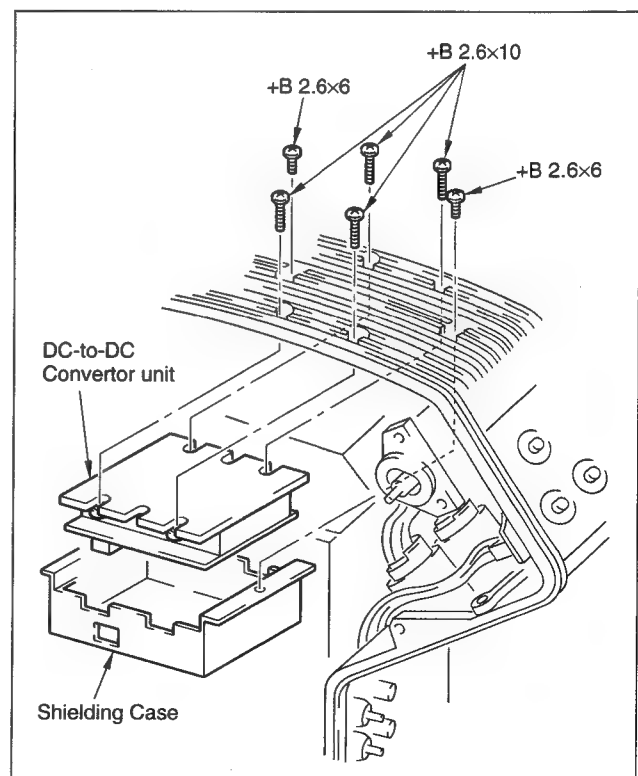
#### 2-4. REPLACEMENT OF DC-TO-DC CONVERTOR UNIT

##### Removal

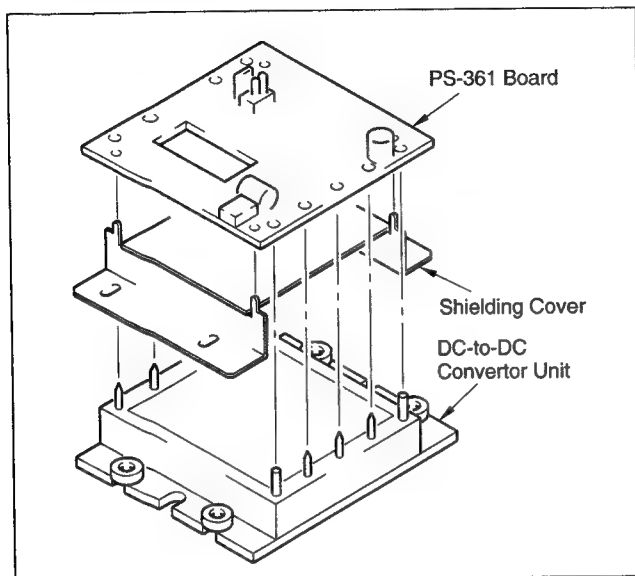
1. Remove the side panel of the camera adaptor referring to "Section 2-1. CABINET REMOVAL".
2. Disconnect the connector CN2 from the DC-to-DC convertor unit.
3. Disconnect the connector CN1 from the DC-to-DC convertor unit using tweezers.



4. Remove the six screws and remove the DC-to-DC convertor unit and the shielding case.

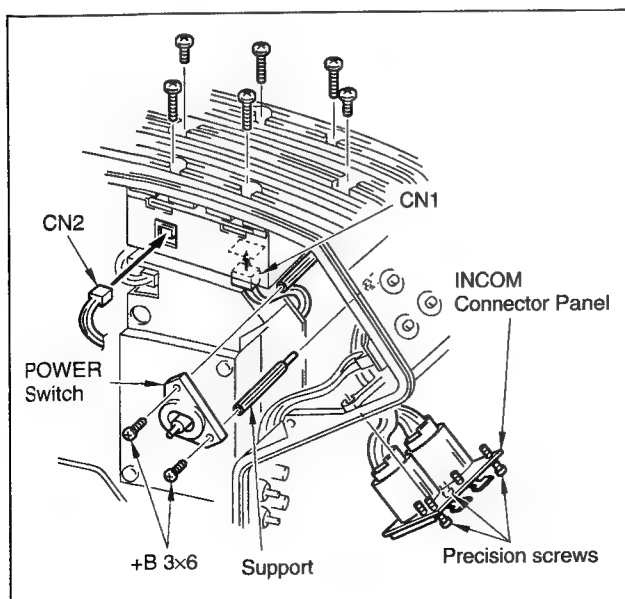


5. Unsolder the PS-361 board at the nine legs of the DC-to-DC converter and at the four legs of the shielding cover to remove the DC-to-DC converter.



#### Installation

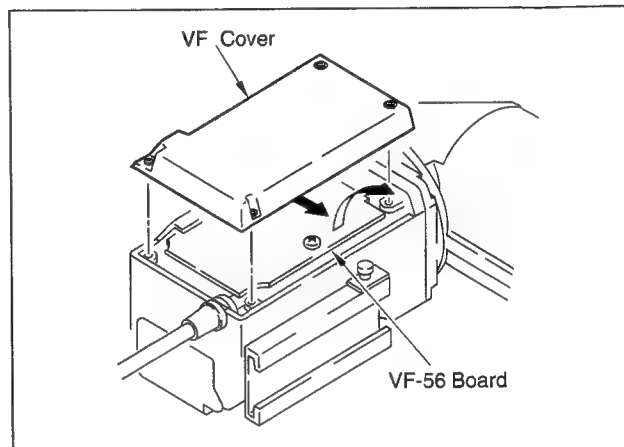
6. Solder the PS-361 board to the DC-to-DC converter together with the shielding cover.
7. Fit the DC-to-DC converter unit and the shielding case to the main unit with the six screws.
8. Remove the two screws and remove the POWER switch and the support.
9. Loosen the three precision screws and remove the INCOM connector panel.
10. Connect the connectors CN1 and CN2 to the DC-to-DC converter unit.



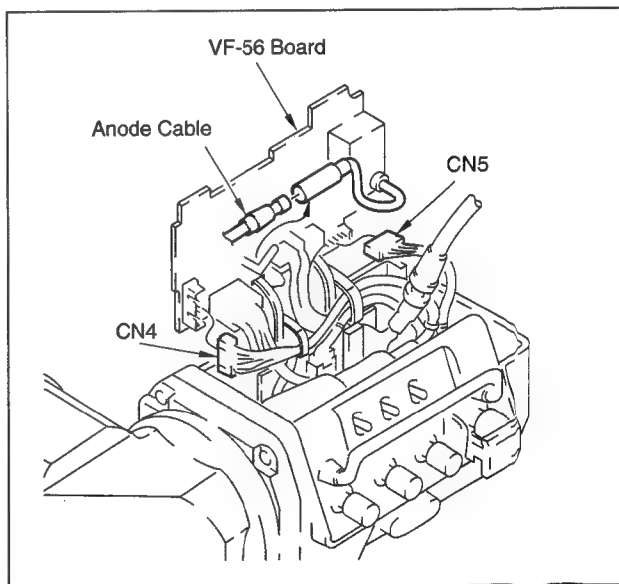
## 2-5. REPLACEMENT OF CRT FOR VIEWFINDER

#### Removal

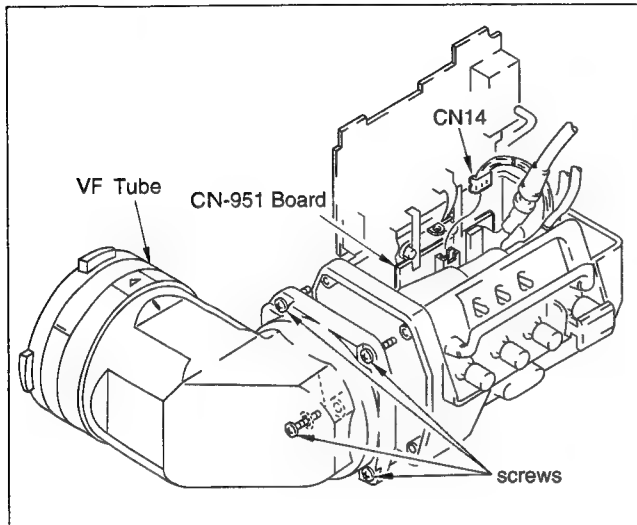
1. Loosen the four screws and remove the VF cover.
2. Loosen the screw fixing the VF-56 board and open the board while moving it in the direction of the arrow.



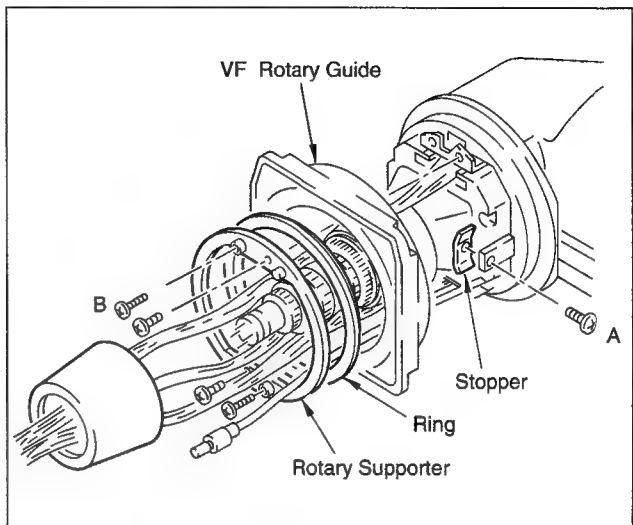
3. Disconnect the three connectors CN4, CN5 and anode cable of the VF-56 board.



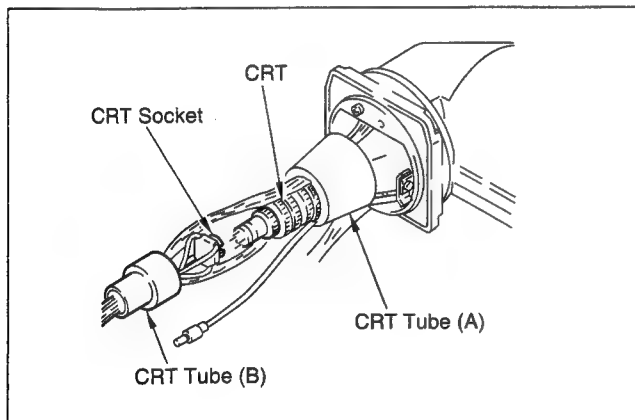
4. Disconnect the connector CN14 from the CN-951 board. Loosen the four screws and remove the VF tube.



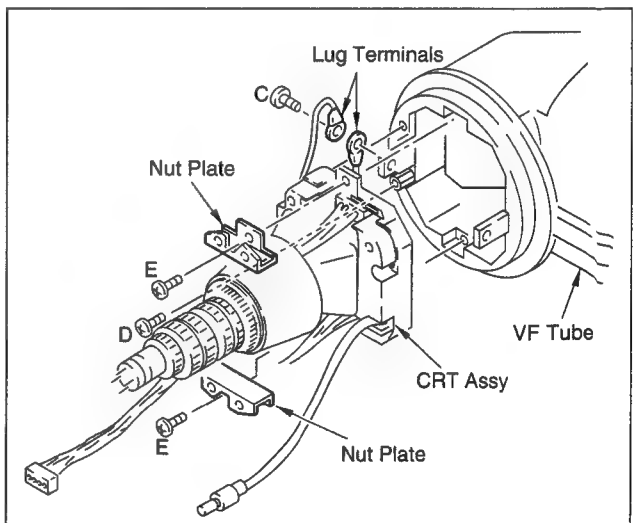
6. Remove the screw (A) and remove the stopper. Remove the four screws (B) and remove the rotary support, ring, and VF rotary guide.



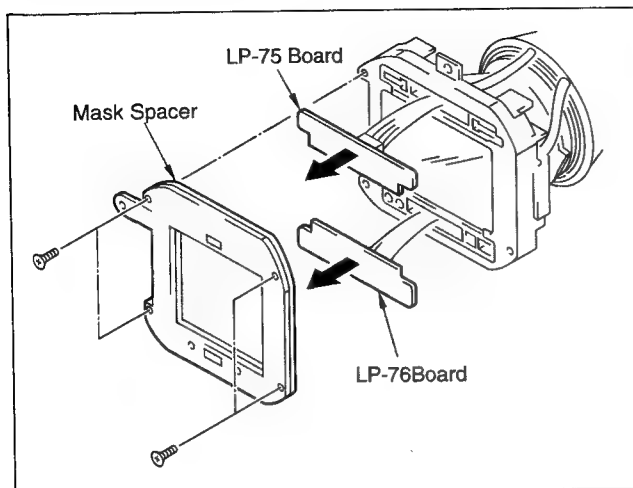
5. Remove the CRT tube (B) and disconnect the CRT socket from the CRT. Remove the CRT tube (A).



7. Remove the screw (C) securing the lug terminals. Remove the screw (D) securing the display plate. Remove the four screws (E) and remove the nut plates. Remove the CRT assembly from the VF tube.



8. Remove the four screws and remove the mask spacer. Remove the LP-75/76 boards in the direction of arrow.



9. Replace the CRT assembly with a new one.

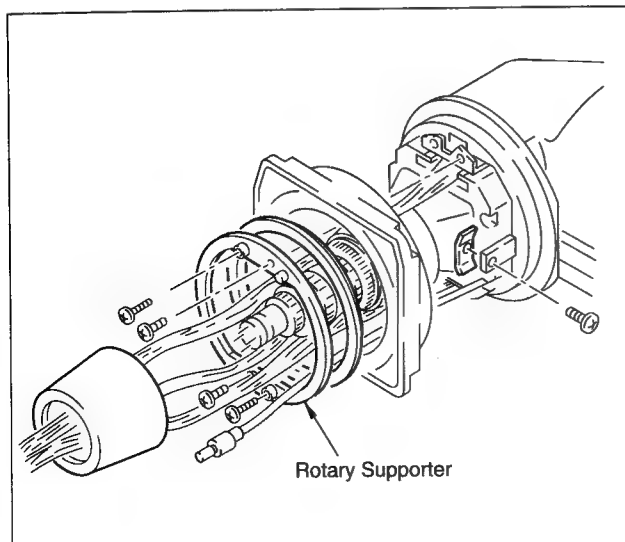
#### Installation

**Note:** When installing, pay full attention to the arrangement of the harness. If incorrectly arranged, the harness may break while using the VF.

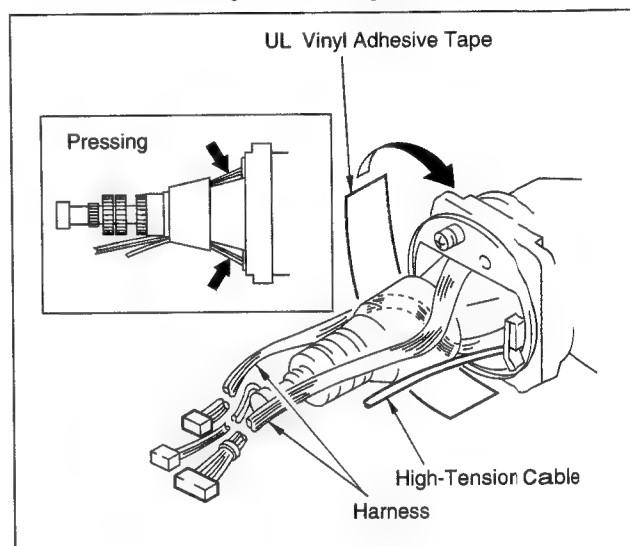
10. Assemble the viewfinder by reversing the procedures 6 to 8.

**Note:** When tightening the screws securing the rotary support, be sure to keep the following tightening torque.

Tightening torque: 0.2 N·m {2 kgf·cm}

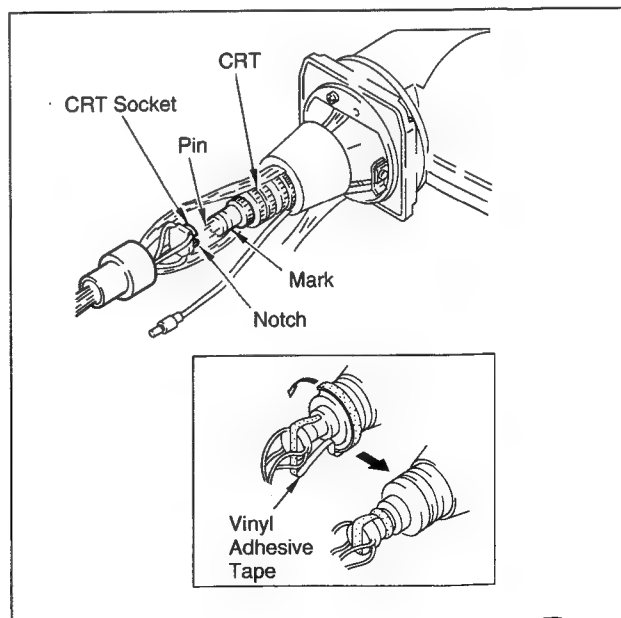


11. Put all wire harnesses from the LP boards together and fasten them with UL vinyl adhesive tape while pressing them in the direction shown by the arrows so that they are not laid on one another. The high-tension cable shall be kept straight. The tied harnesses should be pushed against the CRT so that they do not bulge out.

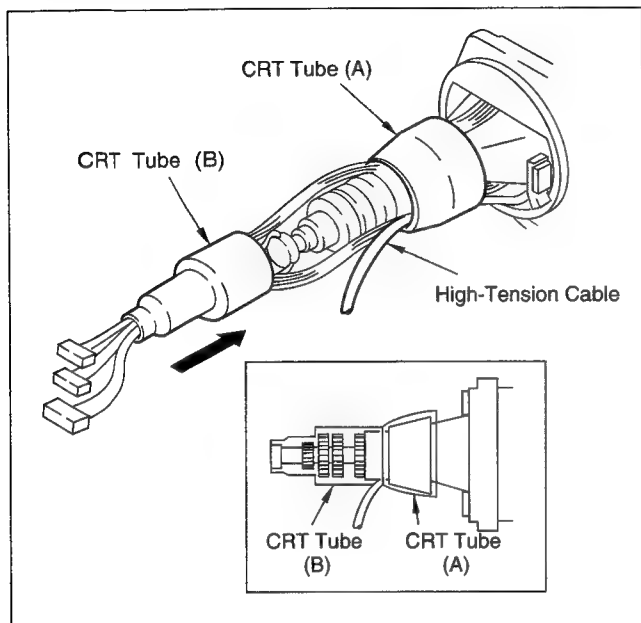


12. Connect the CRT socket to the CRT.

**Note:** When connecting the CRT socket, match a mark on the CRT with a notch of the CRT socket and insert carefully so as not to bend pins of the CRT. After insertion, bind an adhesive tape around the socket part and CRT neck part.



13. Cover the harnesses with CRT tubes (A) and (B) as shown in the figure. Care must be taken so that the harnesses are not slack within the tubes.

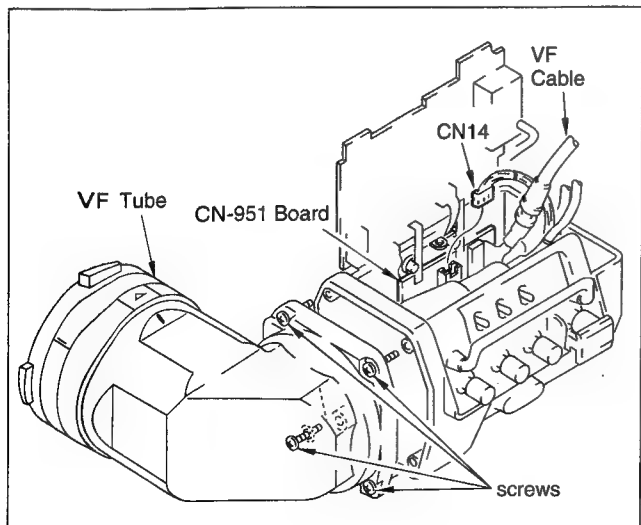


14. Install the CRT assembly into the VF body so that the harnesses are not placed between the CRT and the body.

Connect the harness of the LP-75/76 boards to the CN14 on the CN-951 board.

**Note:** Arrange the harness around the back of the VF cable as shown in the figure.

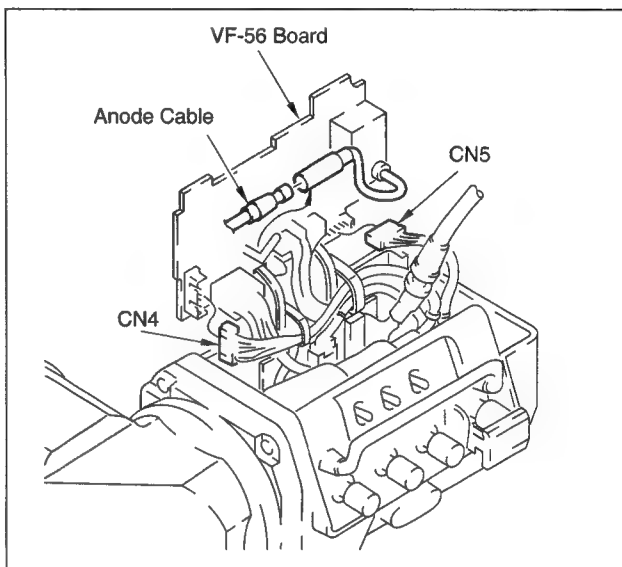
15. Attach the VF tube to the VF body with the four screws.



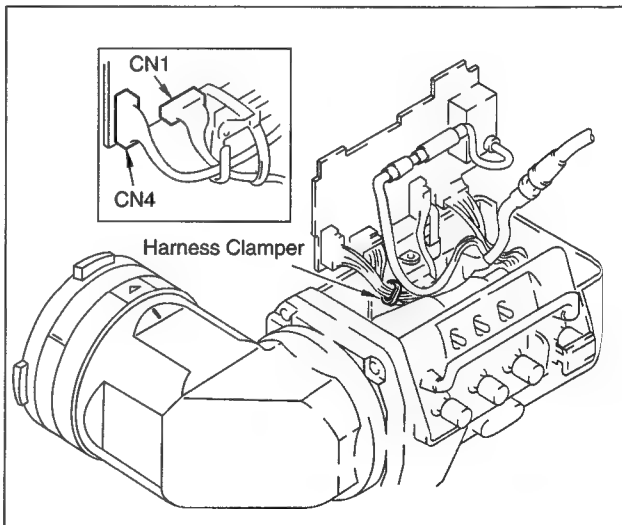
16. Connect the harness of the CRT to the connector CN4 and CN5 on the VF-56 board.

**Note:** Arrange the harness around the back of the VF cable as shown in the figure.

17. Insert the anode cable into the anode cap until it locks.

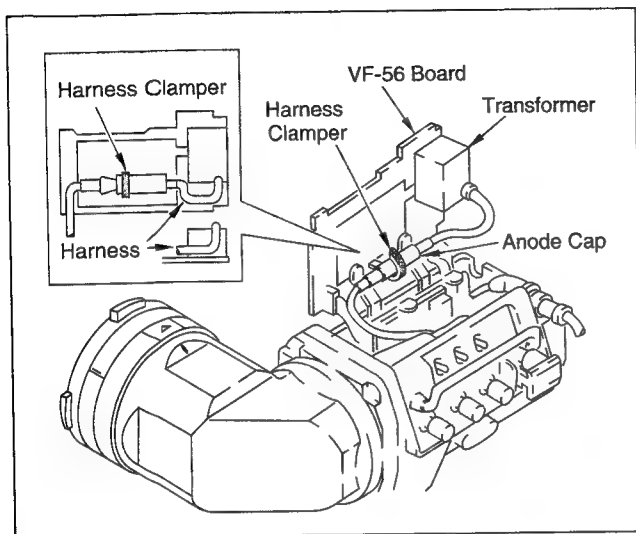


18. Clamp the harnesses of CN1 and CN4 with a harness clumper.

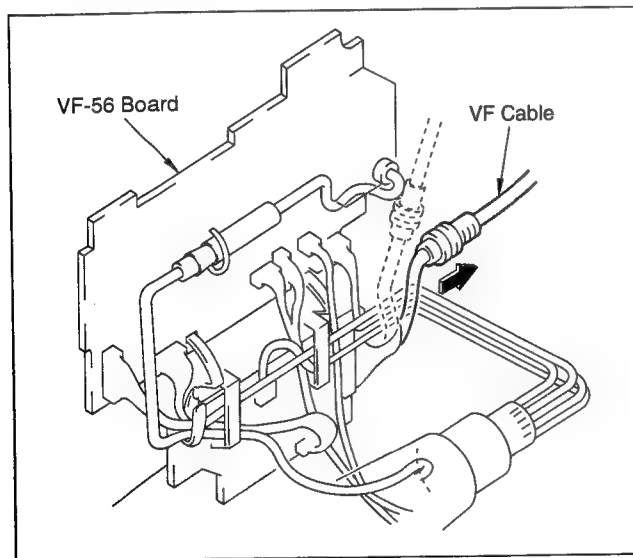




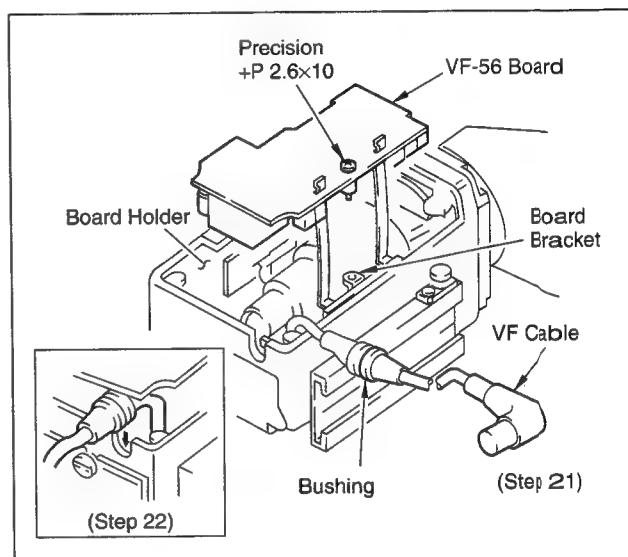
19. Clamp the anode cap at the place shown in the figure with the harness clamper and arrange the harness around the side of the transformer.



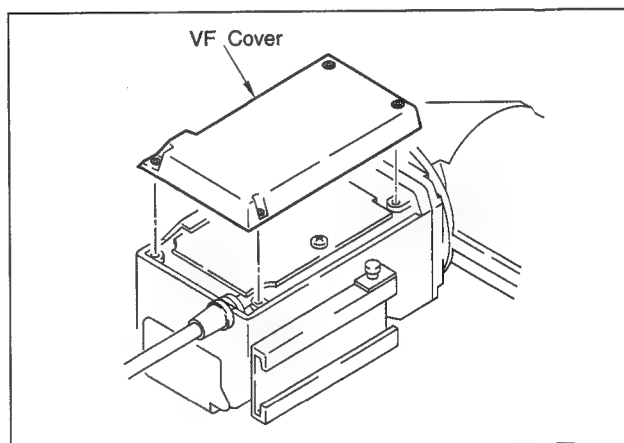
20. Check that the harness has been arranged as shown in the figure. Pull the harness of the CRT by pulling the VF cable in the direction of arrow.



21. Insert the VF-56 board into the board holder, positioning the VF cable as shown in the figure.  
22. Adjust the rubber bush to the notch and insert, and close the VF-56 board.  
23. Fix the VF-56 board onto the board bracket with the screw.



24. Fit the VF cover with the four screws.

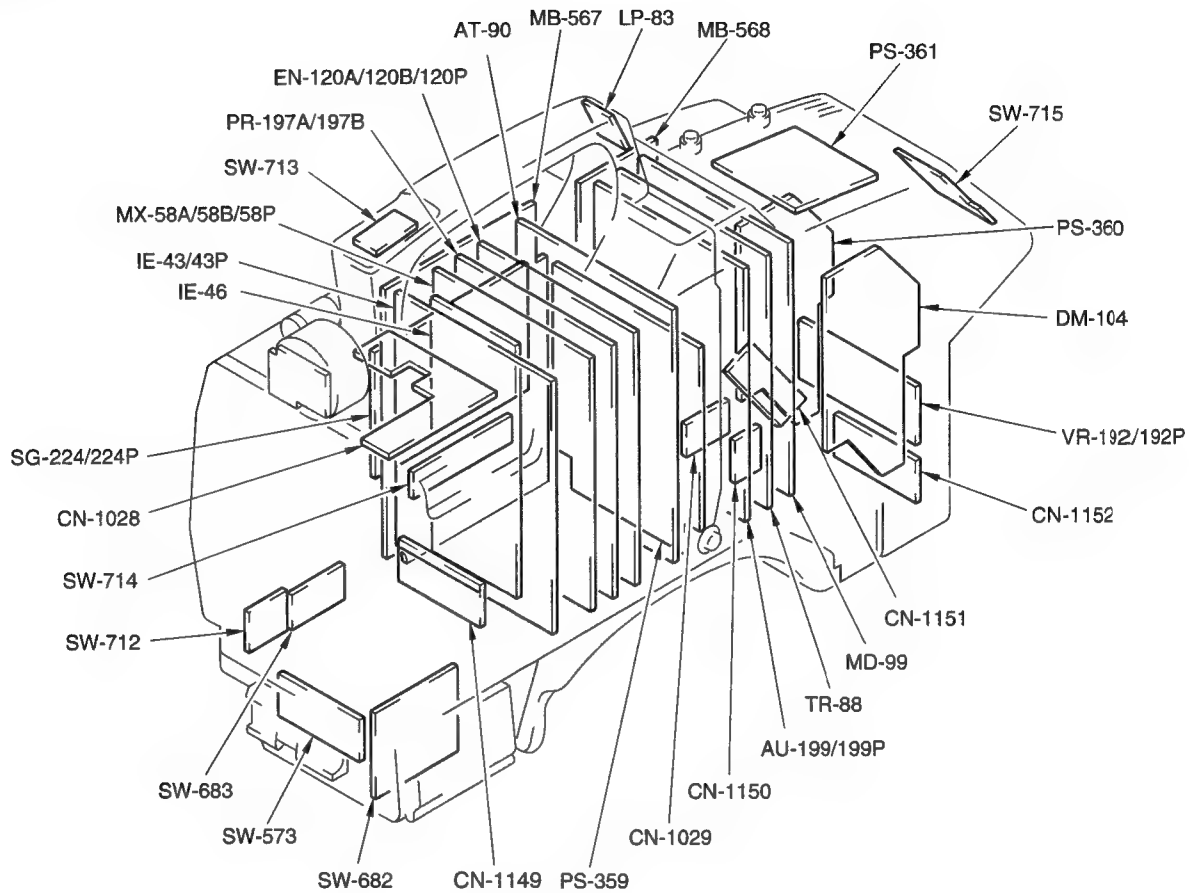


## SECTION 3

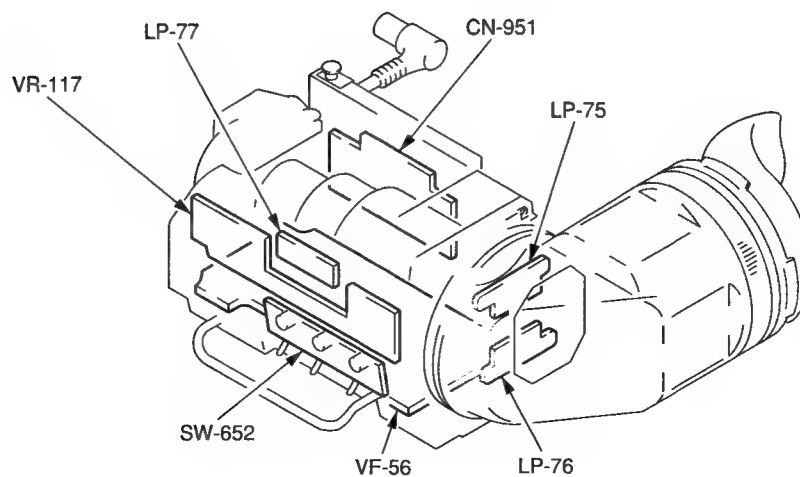
### SERVICE INFORMATION

#### 3-1. BOARD LAYOUT

##### Camera Body



##### Viewfinder



### 3-2. CIRCUIT DESCRIPTION

The circuits of the BVP-750/750P consist of the following blocks :

- Power supply block
- Synchronizing signal block
- Video signal processing block
- System control block
- Audio modulation/demodulation block
- Viewfinder signal processing block

#### [Power supply block]

The CCU supplies 240 Vac, through the Power/Rf separation filter on the DM-104 board, to the PS-360 board. The PS-359/361 board converts this AC voltage into the DC voltages required by the camera. The appropriate voltages are distributed to the relevant boards.

#### [Synchronizing signal block]

The SG-224/224P board features generators which produce synchronizing signals and timing pulses. The AT-90 board decodes serial data received from the CCU and outputs the V RESET pulse to the SG-224/224P board. The SG-224/224P board outputs synchronizing signals and timing pulses, based on the V RESET pulse as well as the H CONT signal, received from the CCU.

#### [Video signal processing block]

The IE-43/43P and IE-46 boards perform the following processings for the R, G, and B video signals, output from the CCD unit OHB (available separately), then feeds them to the MX-58A/58P board:

- Gain control
- White shading correction
- Flare compensation
- Pre-knee correction

The IE-43/43P board also generates the V detail signals based on the R, G, and B signals, then feeds them to the MX-58A/58P board.

The MX-58A/58P board generates the H detail signals based on the signal sent from the IE-43/43P board and it also performs masking processing for the R, G, and B signals when the MATRIX circuit is turned on by turning off the MATRIX OFF button on the MSU control panel. The matrix processing adds microcomponents of other primary colors to the R, G, and B signals to correct the color reproducibility of the camera. The MX-58A/58P board also produces the skin tone signals, which control a detail amount, based on the R, G, and B signals.

The MX-58A/58P board performs the following processings for the detail signals and feeds them to the PR-197A/197B board :

- H/V detail balancing
- Level depending
- Crispeneing
- Detail limiter
- Detail gain control

The PR-197A/197B board performs the following processings for the R, G, and B video signals received from the MX-58A/58P board, and feeds them to the EN-120A/120P board :

- Addition of detail and knee aperture signals
- Pedestal control
- Knee correction
- Knee saturation correction
- Gamma correction
- Black gamma correction
- White clipping

The EN-120A/120P board selects a signal to be sent to the MD-99 board from the R, G and B signals, and an internal color-bars signal which is generated only when a standalone unit is equipped with the camera. It also produces the Y and color difference signals using a matrix circuit and modulates the subcarrier with the difference signal. The resultant is added to the Y signal to output the VBS signal. The EN-120A/120P board also selects a signal to be output to the viewfinder, which will be touched upon later.

The R, G, and B signals received from the EN-120A/120P board are input to the Y, R-Y and B-Y matrix circuits on the MD-99 board. The matrix circuits produce the Y, R-Y, and B-Y signals according to the following matrix :

$$\begin{aligned}Y &= 0.30R + 0.59G + 0.11B \\R-Y &= 0.70R - 0.59G + 0.11B \\B-Y &= -0.30R - 0.59G + 0.89B\end{aligned}$$

The Y, R-Y, and B-Y signals, output from the matrix circuits, are modulated as follows :

$$\begin{aligned}Y &\rightarrow 22.5 \text{ MHz amplitude modulation (DSB)} \rightarrow Y \text{ RF} \\R-Y &\rightarrow 45 \text{ MHz amplitude modulation (DSB)} \rightarrow R-Y \text{ RF} \\B-Y &\rightarrow 45 \text{ MHz amplitude modulation (DSB)} \rightarrow B-Y \text{ RF}\end{aligned}$$

The phase of the carrier used to modulate the R-Y RF signal is shifted by 90° degrees relative to that of the carrier used to modulate the B-Y RF signal. The R-Y RF and B-Y RF signals are mixed to produce the CHROMA RF signal. The CHROMA RF signal and Y RF signal are then fed to the multiplex filter.

The multiplex filter combines or separates the following signals : the Y RF, CHROMA RF, and PROMPT RF signals, described above, the AUDIO RF signal input/output from/to the TR-88 board, and the RET VIDEO signal.

The Y RF and CHROMA RF signals are forwarded, through the multiplex filter and filter on the DM-104 board, to the CCU.

#### [System control block]

The AT-90 board uses a microprocessor to perform the following control, based on the serial data received from the CCU: Auto-white balancing, auto-black balancing, gain control, pedestal control, knee control, gamma control, etc. The AT-90 board also generates character signals to enable the display of conditions on the screen, based on condition signals including self-diagnosis signals received from related boards and the IRIS POSI signal. These character signals are forwarded to the EN-120A/120P board.

#### [Audio modulation/demodulation block]

The CCU sends the AUDIO RF signal, through the multiplex filter, to the TR-88 board. The TR-88 board then demodulates the AUDIO RF signal into the following six signals :

- INCOM 1 and INCOM 2 signals
- PGM 1 and PGM 2 signals
- CCU DATA (serial data) signal
- H CONT signal

The INCOM 1, INCOM 2, PGM 1, and PGM 2 signals are sent via the AU-199/199P board to the INCOM/PGM connector at the camera's rear. The CCU DATA signal is fed to the interface circuit on the AT-90 board. The H CONT signal is fed to the SYNC generator on the SG-224/224P board.

The CHU DATA signal from the AT-90 board, the INCOM 1 and INCOM 2 signals, input via the INCOM/PGM connector at the camera's rear, and the MIC 1 and MIC 2 signals, input via the MIC connector on the side of the camera, are frequency-modulated and integrated into the AUDIO RF signal. The AUDIO RF signal is fed, through the multiplex filter and the filter on the DM-104 board, to the CCU.

#### [Viewfinder signal processing block]

The R, G, and B signals from the PR-197A/197B board, as well as the RET signal from the DM-104 board, are input to the EN-120A/120P board. Each signal can be turned on or off with a switch on the side of the camera. The board adds the character signals from the AT-90 board to the above signals, then feeds them to the viewfinder.

### 3-3. NOTE IN SERVICING

#### 3-3-1. Power Voltage Error Detection Circuit

The DC-to-DC convertor on the PS-359 board is equipped with the circuit to detect an error of the power voltage supplied by the PS-359 board. If the error is detected, the circuit stops supplying the power at once.

When the circuit stops the power by detecting the error, it will not start to supply the power again unless the main power is turned off once.

When the power supply stops due to an error, turn off the power. And after eliminating the problems, power up again.

#### 3-3-2. Precaution of Replacement Parts

##### (1) Safety Related Components Warning

Components identified by shading marked with  $\Delta$  on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation.

Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service manual supplements published by Sony.

##### (2) Standardization of Parts

Replace Parts that are supplied from Sony parts Center can sometimes have different shape and external appearance than what are actually used in equipment. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts." This manual's exploded view and electrical spare parts lists are indicating the parts numbers of the standardized genuine parts at present." Regarding engineering parts and diagrams changes in our engineering department, refer to Sony service bulletins and service manual supplements.

##### (3) Stocked of Parts

The parts marked with "S" in the SP column of the exploded views and electrical spare parts list are normally required for routine service work. Orders for parts marked with "O" will be processed, but allow for additional delivery time.

##### (4) Units of Capacitors, Inductors, and Resistors

The following units are omitted in the schematic diagrams, exploded views, and electrical part lists unless otherwise specified;

Capacitor :  $\mu\text{F}$

Inductor :  $\mu\text{H}$

Resister :  $\Omega$

#### 3-3-3. PROM IC

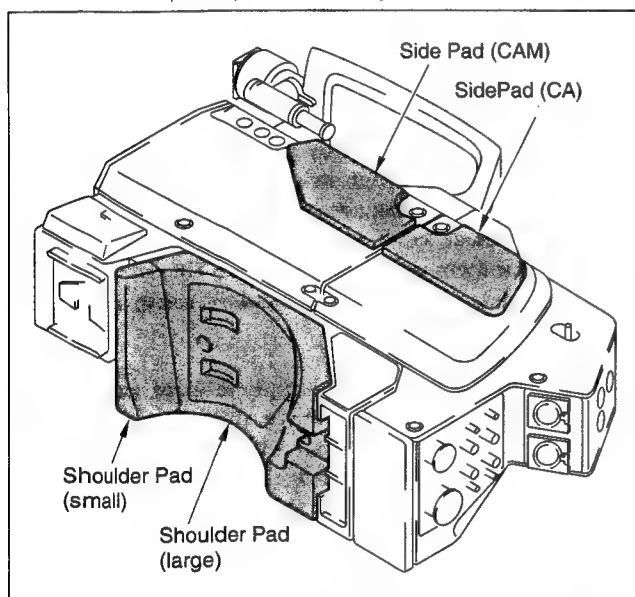
Each PROM IC on the printed circuit board has a suffix to its original designation. This suffix may change according to improvement of IC. Never use a IC having no suffix to its original designation, because its memory has not been programmed.

### 3-4. PERIODIC REPLACEMENT PART

The four kinds of pads shown in the figure are periodic replacement parts. They are subject to cracks with the lapse of time.

Check sometimes by visual, and replace them as necessary.

|                      |                            |
|----------------------|----------------------------|
| Side Pad (CAM)       | Sony Part No. 3-187-027-01 |
| Side Pad (CA)        | Sony Part No. 3-186-943-01 |
| Shoulder Pad (large) | Sony Part No. A-7612-312-C |
| Shoulder Pad (small) | Sony Part No. A-7612-321-A |



\* Each side pad has a both-sided tape at the back of it.

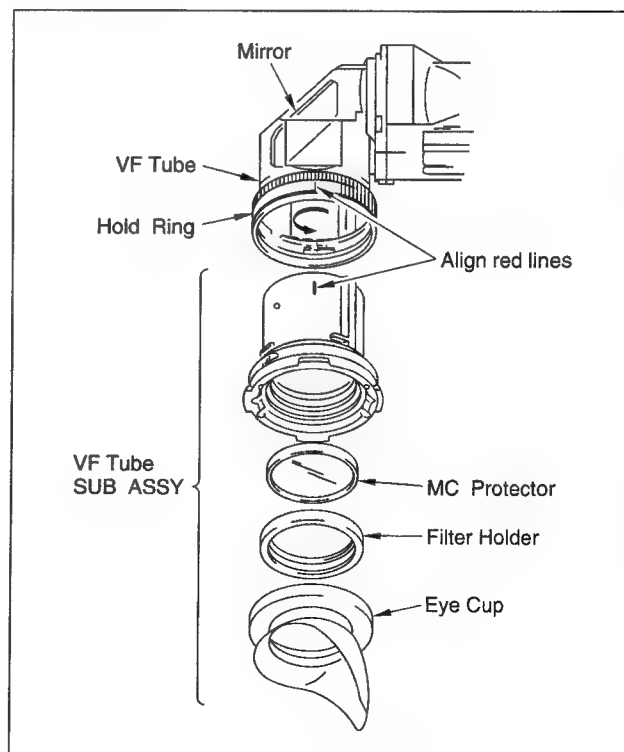
### 3-5. CLEANING OF VIEWFINDER

By extracting VF tube sub assy, lens and MC protector can be easily cleaned. And also dust on the CRT surface or mirror can be easily cleaned off.

1. Turn the hold ring to the left and extract the VF tube sub assy.
2. Detach the eyecup.
3. Remove the MC protector together with the filter holder.
4. Clean the lens and MC protector with a commercially available camera lens cleaner. Blow off dust with a blower carefully so as not to flaw the mirror.
5. After the cleaning is completed, install by reversing the preceding steps. Align red lines of the VF tube and VF tube sub assy when inserting, and turn the hold ring to the right until it locks.

#### NOTE:

- Do not use any type of solvent, such as alcohol, benzine or thinner to remove stains.
- Be sure to attach the eyecup to the VF, or the MC protector may come off.
- To protect the viewfinder lens from drops, put the MC protector in the filter holder and attach the eyecup securely.



### 3-6. ERROR MESSAGES IN AUTOMATIC ADJUSTMENT MODE

When an error message is displayed on the viewfinder in automatic adjustment mode, take the following action.

#### ① "OVER FLOW"

This message is displayed when the compensation value exceeds the limit of the compensation range. Check the setting of the camera. If the setting is correct, the printed circuit board must be adjusted.

#### ② "LOW LEVEL"

This message is displayed when the video signal level is too low to be adjusted during the white balance adjustment. Raise the video signal level by increasing the illumination intensity, opening the lens iris, or increasing the gain so that it can be adjusted.

#### ③ "TIME LIMIT"

This message is displayed when automatic adjustment can not be completed within the specified time. Check the setting of the camera. If the setting is correct, the printed circuit board must be adjusted.

#### ④ "NOT CLOSED"

This message is displayed when the lens iris is not completely stopped down during the black balance adjustment.

#### Other Messages

##### • "BREAK"

This message is displayed when the automatic adjustment is interrupted by the BREAK command.

### 3-7. SELF-DIAGNOSIS

The unit is provided with the self-diagnoses function to display a faulty board or power voltage error on the viewfinder screen. An accumulated power-on time of the camera is also displayed.

To display the "Diagnosis" page on page 3, use the DISP ON/OFF/PAGE switch on the right side of camera. For details on the operation, see the operation manual for the camera.

| * Diagnosis * |        |             |         |
|---------------|--------|-------------|---------|
| ① {           | IE :-- | ③ OHB :--   |         |
|               | MX :-- | ⑥ POWER :-- |         |
|               | PR :-- |             |         |
| ②             | EN :-- |             |         |
| ③ {           | SG :-- | ⑦ {         | CCU :-- |
|               | MD :-- |             | RM : NC |
|               | AU :-- |             | 100H    |
| ④             | AT :-- | ⑧           |         |
| ⑤             | TR :-- |             |         |

The unit diagnoses for each item based on the following conditions.

- ① The levels of the R, G and B video signals outputting at the IE, MX or PR board exceed the standard value.
- ② The viewfinder output is correct.
- ③ The power and serial data are correctly received.
- ④ The battery voltage for a backup memory exceeds the standard value.
- ⑤ The level of the AUDIO RF signal exceeds the standard value.
- ⑥ For a normal operation, a power voltage from the triaxial connector exceeds the standard value.
- ⑦ A serial data from the CCU/RM is correctly received. And when the RM is not connected, "NC" is displayed.
- ⑧ A power-on time of the camera is displayed. (Unit: H)

### 3-8. TOOLS AND FIXTURES

#### Extension Board EX-458

Sony Part No.: A-8265-739-A


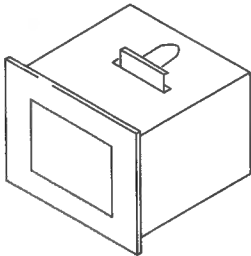
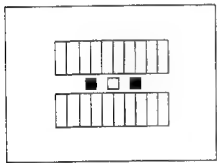

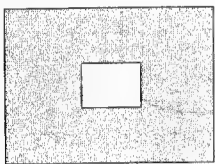

#### Alignment Tool

Sony Part No.: 7-70-733-01

## SECTION 4 ALIGNMENT

### 4-1. PREPARATION

#### 4-1-1. Equipment Required

|  |   |
|--|---|
| <b>Multi-Burst Chart</b><br>Sony part number:<br>J-6026-110-A<br>                                 | <b>Pattern Box PTB-500</b><br>Sony part number:<br>J-6029-140-B<br>• Light source for test chart<br>Power supply AC 90-240 V<br> |
| <b>Grayscale Chart</b><br>Sony part number:<br>J-6026-130-B<br>                                  | <b>Extension Board EX-458</b><br>Sony part number:<br>A-8265-739-A<br>• Supplied accessory<br>(BVP-750/750P)<br>                |
| <b>White Window Chart</b><br>Make hole in the center of black paper as shown in the figure.<br> | <b>Extension Board BKP-7900</b><br>Extension Board for<br>CCU-700/700P (Optional)<br>  |

#### Equipment

- Digital voltmeter
- Oscilloscope (150 MHz or more)
- Vectorscope
- Waveform monitor
- B/W monitor  
(Horizontal resolution: more than 700 TV lines)
- Color monitor
- Video signal generator (Tektronix 1410 or equivalent)
- Frequency counter
- Spectrum analyzer
- Audio generator
- DC power supply

#### Peripheral Equipment

- Camera control unit CCU-700/700P
- Master setup unit MSU-700
- CCD unit OHB-750/750P

#### 4-1-2. Notes in Adjustment

When performing the adjustment, read the following comments.

1. All measuring equipments must be calibrated.
2. Also the adjustment of Camera Control Unit CCU-700/700P and CCD unit OHB-750/750P must be completed.
3. "4-1-4. Initial setting" should be done before the adjustment.
4. "4-2. ADJUSTMENT ITEMS" is for overall adjustment procedures.
5. Flowcharts in "4-4. PARTIAL ADJUSTMENT" show the adjustment in order to perform the partial adjustment.
6. When adjusting  $\phi$ LV101 (RET FREQ) and  $\phi$ LV102 (RET TUNE) on the DM-104 board, long TRIAX cable (100 to 600 m) is required. Therefore, perform the adjustment only when replacing a part.  
Refer to the following items.  
4-2-52. Return Video Demod. Adjustment  
4-2-53. Return video Level Adjustment
7. When adjusting  $\phi$ RV801 (PROMPT DEV),  $\phi$ CV801 (BPF ADJ 1),  $\phi$ CV802 (BPF ADJ 2) on the MD-99 board,  $\phi$ LV201 (PROMPT FREQ),  $\phi$ LV202 (PROMPT TUNE) and  $\phi$ RV202 (PROMPT LEVEL) on the DM-104 board, long TRIAX cable (100 to 300 m) is required. Therefore, perform the adjustment only when replacing  $\phi$ LV201 (PROMPT FREQ) or  $\phi$ LV202 (PROMPT TUNE) on the DM-104 board.  
Refer to the following items.  
4-2-50. TX PROMPT VIDEO Demod. Adjustment  
4-2-51. TX PROMPT VIDEO BPF Adjustment  
4-2-54. RX PROMPT VIDEO Demod. Adjustment  
4-2-56. RX PROMPT VIDEO Level Adjustment
8. When adjusting  $\phi$ RV201 (RF AGC DLY) on the DM-104 board, TRIAX cable (50 to 150 m) is required.  
Refer to the following items.  
4-2-55. RX PROMPT VIDEO RF AGC Adjustment
9. If the amplitude level of the measured waveform is blurred on the waveform monitor screen, set the RESPONSE switch on the waveform monitor to "LUM" mode.

10. The adjustment value in Section 4 Alignment is described as the factory setting value.  
Be careful when performing the adjustment, as there are same cases where adjustment values vary according to user setting.

11. Board names are some different between NTSC model (BVP-750) and PAL model (BVP-750P).

**[for NTSC model]**

Read the board names in this section as following names.

MX-58 → MX-58A

PR-197 → PR-197A

**[for PAL model]**

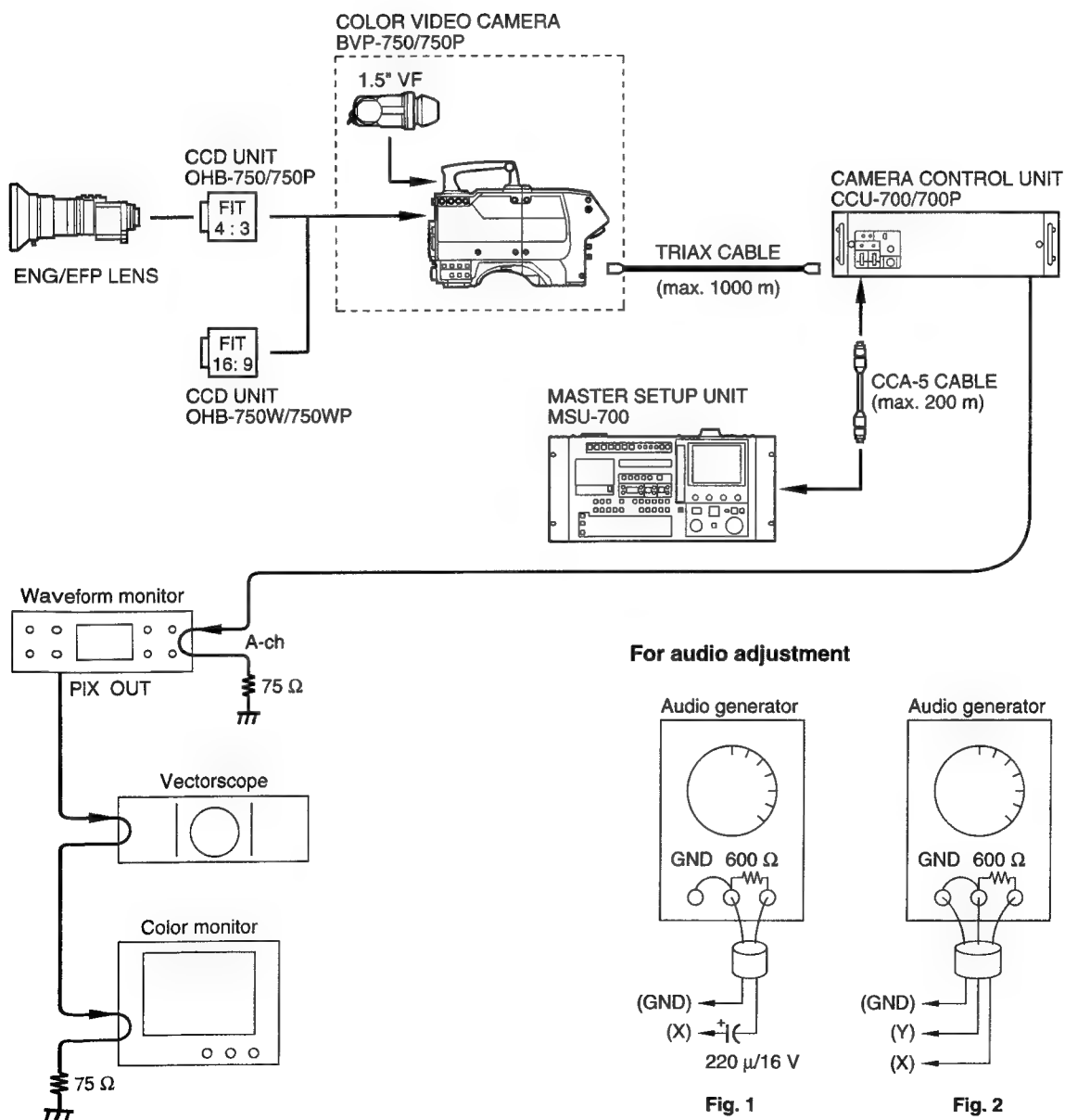
Read the board names in this section as following names.

AU-199 → AU-199P

MX-58 → MX-58P

PR-197 → PR-197B

**4-1-3. Connection**



**Note:** This alignment is described on the premise that the MSU-700 is used. Therefore, the condition of switch setting, and so on, are for the MSU-700.



## 4-1-4. Initial Setting

### 1. Initial setting of each switch

#### BVP-750/750P

##### [PR-197 board]

|                             |      |
|-----------------------------|------|
| S901-1 (AT SLOPE)           | "ON" |
| S901-2 (WHITE CLIP ON/OFF)  | "ON" |
| S901-3 (GAMMA ON/OFF)       | "ON" |
| S901-4 (BLACK GAMMA ON/OFF) | "ON" |
| S901-5 (KNEE MAX ON/OFF)    | "ON" |

##### [EN-120 board]

|                      |          |
|----------------------|----------|
| S1 (SELECT ↔ Y ONLY) | "SELECT" |
| S2-1 (4:3 ATT)       | "OFF"    |
| S2-2 (4:3 CURSOR)    | "OFF"    |
| S100 (VF ↔ RET)      | "VF"     |
| S200-1 (ZEBRA 70 %)  | "ON"     |
| S200-2 (ZEBRA 100 %) | "ON"     |
| S400 (I/V)           | "ON"     |
| S401 (Q/U)           | "ON"     |
| S600 (CCU VBS ↔ Y)   | "Y"      |
| S601-1 (CCU CALL)    | "ON"     |
| S601-2 (CHU CALL)    | "OFF"    |

##### [AU-199 board]

|                                  |                  |
|----------------------------------|------------------|
| S40-1 (UNBAL)                    | "OFF"            |
| S40-2 (UNBAL)                    | "OFF"            |
| S150 (INCOM 1 PGM MIX)           | Upper side (OFF) |
| S152 (INCOM 2 PGM MIX)           | Upper side (OFF) |
| S350 (TRACKER (T) 0 dB/-20 dB)   | "0 dB"           |
| S351 (MIC MONITOR ON/OFF)        | "OFF"            |
| S352-1 (TRACKER/PGM ON/OFF)      | "ON"             |
| S352-2 (TRACKER/INCOM 2 ON/OFF)  | "ON"             |
| S352-3 (TRACKER/INCOM 2 ON/OFF)  | "ON"             |
| S800 (MIC POWER +48 V/OFF/+12 V) | "OFF"            |
| S801 (LINE LEVEL 0 dB/-20 dB)    | "0 dB"           |
| S900 (RTS 1 NORM/RTS)            | "NORM"           |
| S901 (RTS 2 NORM/RTS)            | "NORM"           |

##### [MD-99 board]

|                          |             |
|--------------------------|-------------|
| S1 (R ON/OFF)            | "ON"        |
| S2 (G ON/OFF)            | "ON"        |
| S3 (B ON/OFF)            | "ON"        |
| S4 (CCU → CAM/CAM → CCU) | "CCU → CAM" |

#### MSU-700

##### • SIGNAL SELECT BLOCK

|               |                        |
|---------------|------------------------|
| ALL button    | "OFF (light up) "      |
| CAM PW button | "ON (light up) "       |
| TEST 1 button | "OFF (lamp goes off) " |
| TEST 2 button | "OFF (lamp goes off) " |
| BARS button   | "OFF (lamp goes off) " |
| CLOSE button  | "OFF (lamp goes off) " |

##### • CAMERA HEAD/CCU CIRCUIT ON/OFF BLOCK

|                   |                        |
|-------------------|------------------------|
| DETAIL OFF button | "OFF (light up) "      |
| KNEE OFF button   | "OFF (light up) "      |
| AUTO KNEE button  | "OFF (lamp goes off) " |
| MATRIX OFF button | "OFF (light up) "      |

##### • AUTO SETUP BLOCK

|              |                        |
|--------------|------------------------|
| LEVEL button | "OFF (lamp goes off) " |
| WHITE button | "OFF (lamp goes off) " |
| BLACK button | "OFF (lamp goes off) " |

##### • OTHERS

|                    |                       |
|--------------------|-----------------------|
| GAMMA OFF button   | "ON (lamp goes off) " |
| MASTER GAIN button | "0"                   |

### 2. Presetting of compensation signal

- Preset (center value) all compensation signals output from the microprocessor before starting the adjustments. If not, the adjustments will not be set correctly even if the specifications are met.

1. Perform the presetting on the instructions of the viewfinder screen.
2. Push up the DISPLAY switch to PAGE side and the UP/DOWN switch to UP combination, then, the Maintenance screen is displayed.
3. Move the cursor to "Reference Store" by using the SEL switch, and push up the UP/DOWN switch to UP side. Then, the Reference Store page is displayed.
4. Move the cursor to "All Preset" by using the SEL switch, and push up the UP/DOWN switch to UP side.
5. As the result, the compensation data is preset.

## **4-2. ADJUSTMENT ITEMS**

### **ENCODER SYSTEM ADJUSTMENT**

- 4-2-1. SYNC, Video Level Adjustment
- 4-2-2. RGB Level Adjustment
- 4-2-3. I (V) Level Adjustment
- 4-2-4. Q (U) Level Adjustment
- 4-2-5. I (V) /Q (U) 90° Adjustment
- 4-2-6. Burst Adjustment
- 4-2-7. SYNC Phase Adjustment
- 4-2-8. BF PULSE Adjustment

### **VIDEO SIGNAL SYSTEM ADJUSTMENT**

- 4-2-9. EN MONITOR GAIN Adjustment
- 4-2-10. EN Gain Adjustment
- 4-2-11. Pedestal Pre-adjustment
- 4-2-12. V MOD Balance Adjustment
- 4-2-13. TEST Signal Adjustment
- 4-2-14. Pedestal Adjustment
- 4-2-15. Flare Adjustment
- 4-2-16. IE G/R/B OUT Level Adjustment
- 4-2-17. MX MATRIX OFFSET Adjustment
- 4-2-18. MX Gain Adjustment
- 4-2-19. MX Video DC Balance Adjustment
- 4-2-20. PR Gain Adjustment
- 4-2-21. Gamma Balance Adjustment
- 4-2-22. Gamma Correction Adjustment
- 4-2-23. Black Gamma Adjustment
- 4-2-24. Knee Compensation Adjustment
- 4-2-25. White Clip Adjustment

### **DETAIL SIGNAL SYSTEM ADJUSTMENT**

- 4-2-26. Spurious Signal Adjustment
- 4-2-27. V DTL NULL Adjustment
- 4-2-28. IE Frequency Response Adjustment
- 4-2-29. G/R/B 1H/2H PHASE Adjustment
- 4-2-30. H DTL Balance Adjustment
- 4-2-31. HF/LF DTL Balance Adjustment
- 4-2-32. DC Offset Adjustment
- 4-2-33. Level Dependent Adjustment
- 4-2-34. Crispening Adjustment
- 4-2-35. DTL Limiter Adjustment
- 4-2-36. H DTL PHASE Adjustment
- 4-2-37. H/V RATIO Adjustment
- 4-2-38. DTL Gain Adjustment
- 4-2-39. Skin Tone Adjustment

### **TRIAx INTERFACE SYSTEM ADJUSTMENT**

- 4-2-40. VCO DC SET Adjustment
- 4-2-41. Y REF Level Adjustment
- 4-2-42. Y/SKIN DC Balance Adjustment
- 4-2-43. Y/SKIN 90° Adjustment
- 4-2-44. R-Y REF Level Adjustment
- 4-2-45. B-Y REF Level Adjustment
- 4-2-46. R-Y/B-Y Carrier Balance Adjustment
- 4-2-47. R-Y/B-Y DC Balance Adjustment
- 4-2-48. R-Y/B-Y 90° Adjustment
- 4-2-49. 67.5MHz TRAP Adjustment
- 4-2-50. TX PROMPT VIDEO Demod. Adjustment
- 4-2-51. TX PROMPT VIDEO BPF Adjustment
- 4-2-52. Return video Demod. Adjustment
- 4-2-53. Return video Level Adjustment
- 4-2-54. RX PROMPT VIDEO Demod. Adjustment
- 4-2-55. RX PROMPT VIDEO RF AGC Adjustment
- 4-2-56. RX PROMPT VIDEO Level Adjustment

### **INTERCOM SYSTEM ADJUSTMENT**

- 4-2-57. Tuning Adjustment
- 4-2-58. Frequency Set Adjustment
- 4-2-59. INCOM 1 Deviation Adjustment
- 4-2-60. INCOM 2 Deviation Adjustment
- 4-2-61. MIC 1 Deviation Adjustment
- 4-2-62. MIC 2 Deviation Adjustment
- 4-2-63. INCOM 1 Demod. Adjustment
- 4-2-64. INCOM 1 Level Adjustment
- 4-2-65. INCOM 1 SIDE TONE Adjustment  
(AU-199 board adjustment 1)
- 4-2-66. RTS 1 CANCEL Adjustment  
(AU-199 board adjustment 2)
- 4-2-67. INCOM 2 Demod. Adjustment
- 4-2-68. INCOM 2 Level Adjustment
- 4-2-69. INCOM 2 SIDE TONE Adjustment  
(AU-199 board adjustment 3)
- 4-2-70. RTS 2 CANCEL Adjustment  
(AU-199 board adjustment 4)
- 4-2-71. PGM Demod. Adjustment
- 4-2-72. PGM Level Adjustment
- 4-2-73. TRACKER (T) Level Adjustment  
(AU-199 board adjustment 5)

### **VIEWFINDER SYSTEM ADJUSTMENT**

- 4-2-74. Preparation of Viewfinder System Adjustment
- 4-2-75. Vertical Hold Adjustment
- 4-2-76. Horizontal Hold Adjustment
- 4-2-77. Bright Set Adjustment
- 4-2-78. Focus Adjustment
- 4-2-79. Picture Frame Adjustment
- 4-2-80. Heater Voltage Adjustment

#### 4-2-1. SYNC, Video Level Adjustment

**Equipment** : Waveform monitor, Oscilloscope

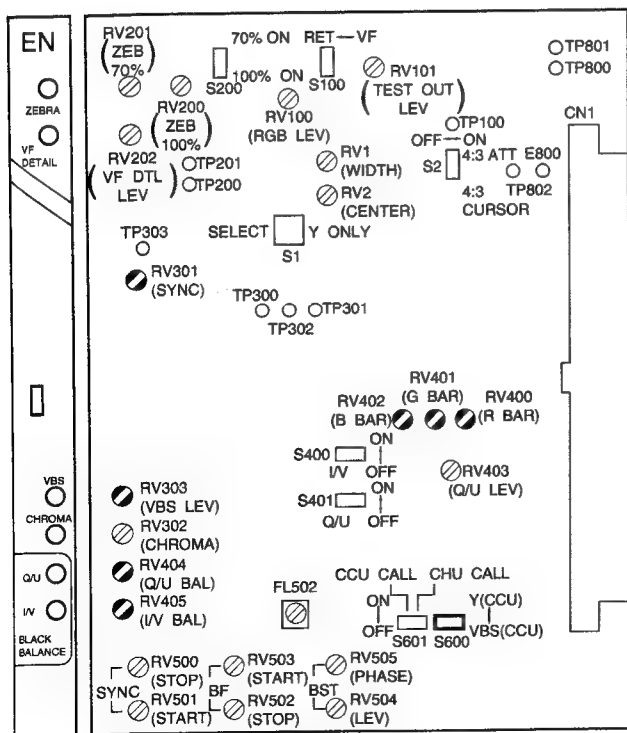
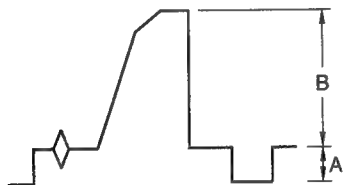
**To be extended** : EN-120 board

**Preparation:**

- TEST 1 button/MSU-700 → "ON"
- Perform the white balance adjustment/MSU-700 so that the level at TP48 (R IN), TP44 (G IN) and TP40 (B IN) /extension board are 0.7 V p-p.
- S600/EN-120 board → "VBS(CCU)"

**Adjustment Procedure**

1. Adjust RV303 (VBS LEV) /EN-120 board so that the level "B" at VBS OUT connector is 0.714 V.
2. Adjust RV301 (SYNC) /EN-120 board so that the level "A" at VBS OUT connector is 0.286 V.



EN-120A/120B/120P BOARD (COMPONENT SIDE)

#### 4-2-2. RGB Level Adjustment

**Equipment** : Waveform monitor, Oscilloscope

**To be extended** : EN-120 board

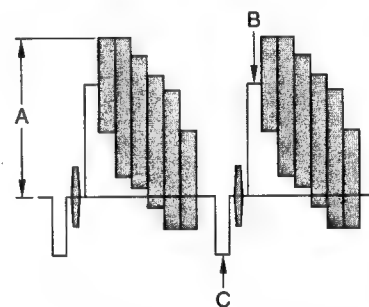
**Preparation:**

- Set S1/AT-90 board to "D", and turn the UP/DOWN switch/AT-90 board to "UP" side.

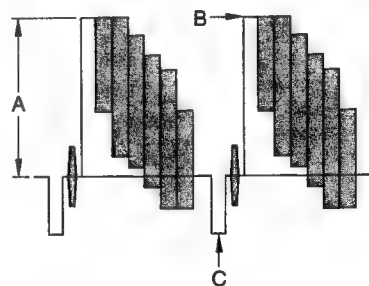
**Adjustment Procedure**

1. Adjust RV400 (R BAR), RV401 (G BAR) and RV402 (B BAR) /EN-120 board so that the level "A" at VBS OUT connector (75  $\Omega$  terminated) is 100 IRE (PAL: 700 mV) and the carrier leak at portion "B" is minimum.
2. Adjust RV404 (Q/U BAL) and RV405 (I/V BAR)/EN-120 board so that the aberration of portion "C" is minimum.

[For NTSC]



[For PAL]



3. Perform the adjustment in STEP 1 again.

### 4-2-3. I (V) Level Adjustment

**Equipment** : Vectorscope

**To be extended** : EN-120 board

**Preparation:**

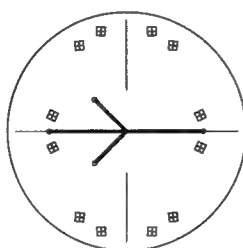
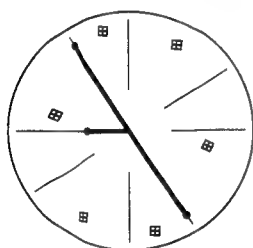
- S401 (Q/U) /EN-120 board → "OFF"
- Turn PHASE knob on the Vectorscope so that the beam line of I (V) signal matches the I (V) axis.

#### Adjustment Procedure

1. Adjust RV302 (CHROMA) /EN-120 board so that the beam spot of I (V) signal fit the scale.

[For NTSC]

[For PAL]



#### Note:

After the adjustment, set as follows.

- S401 (Q/U) /EN-120 → "ON"

### 4-2-4. Q (U) Level Adjustment

**Equipment** : Vectorscope

**To be extended** : EN-120 board

**Preparation:**

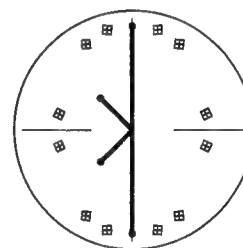
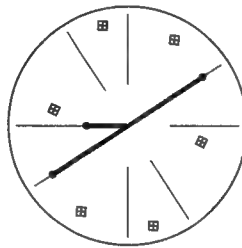
- S400 (I/V) /EN-120 board → "OFF"
- Turn PHASE knob on the Vectorscope so that the beam line of Q (U) signal matches the Q (U) axis.

#### Adjustment Procedure

1. Adjust RV403 (Q LEV) /EN-120 board so that the beam spot of Q (U) signal fit the scale.

[For NTSC]

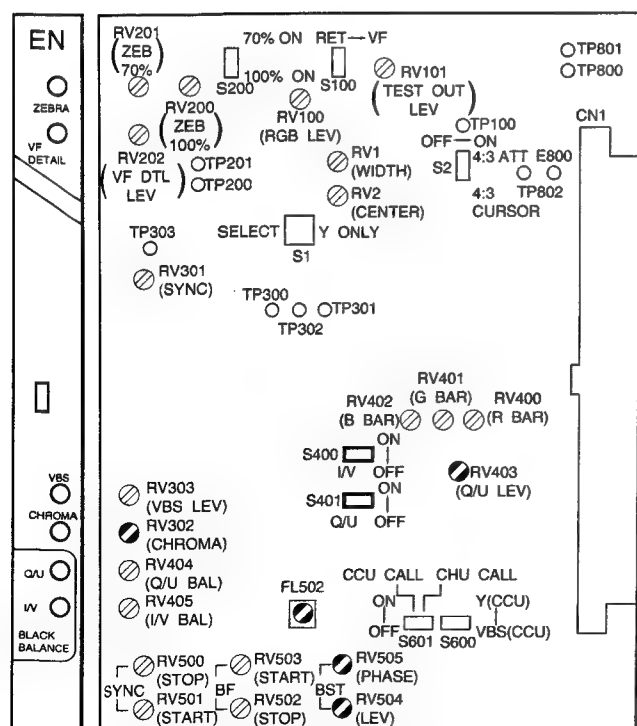
[For PAL]



#### Note:

After the adjustment, set as follows.

- S400 (I/V) /EN-120 → "ON"



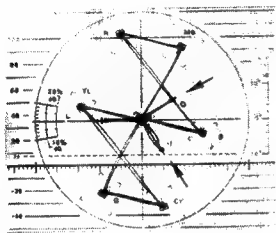
EN-120A/120B/120P BOARD (COMPONENT SIDE)

#### 4-2-5. I (V) /Q (U) 90° Adjustment

Equipment : Vectorscope  
To be extended : EN-120 board

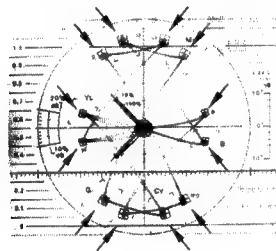
##### Adjustment Procedure [For NTSC]

1. Adjust  $\odot$ FL502/EN-120 board so that the beam spot of I signal matches the I axis and the beam spot of Q signal matches the Q axis.



##### Adjustment Procedure [For PAL]

1. Adjust  $\odot$ FL502/EN-120 board so that the each beam spot of color bars signal matches in the mark "田" on the vectorscope screen.

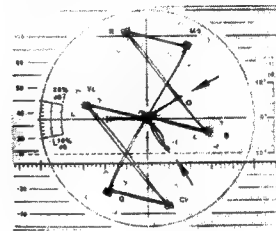


#### 4-2-6. Burst Adjustment

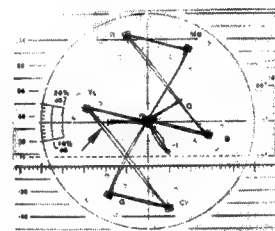
Equipment : Vectorscope  
To be extended : EN-120 board

##### Adjustment Procedure [For NTSC]

1. Adjust  $\odot$ RV505 (BST PHASE) /EN-120 board so that the beam spot of I signal matches the I axis and the beam spot of Q signal matches the Q axis.

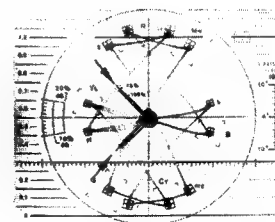


2. Adjust  $\odot$ RV504 (BST LEV) /EN-120 board so that burst level is 40 IRE.

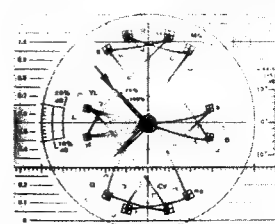


##### Adjustment Procedure [For PAL]

1. Adjust  $\odot$ RV505 (BST PHASE) /EN-120 board so that the beam spots of burst signals match the each burst axis.



2. Adjust  $\odot$ RV504 (BST LEV) /EN-120 board so that the burst level is 300 mV (75 % mark).



#### 4-2-7. SYNC Phase Adjustment

**Object** : Overall white (white portion of the pattern box)

**Equipment** : Waveform monitor

**To be extended :** EN-120 board

**Preparation:**

- CLOSE button/MSU-700 → "OFF (lamp goes off) "
- IRIS AUTO button/MSU-700 → "ON"
- Adjust the zoom control of the lens so that the white portion of the pattern box fully occupies the monitor screen.

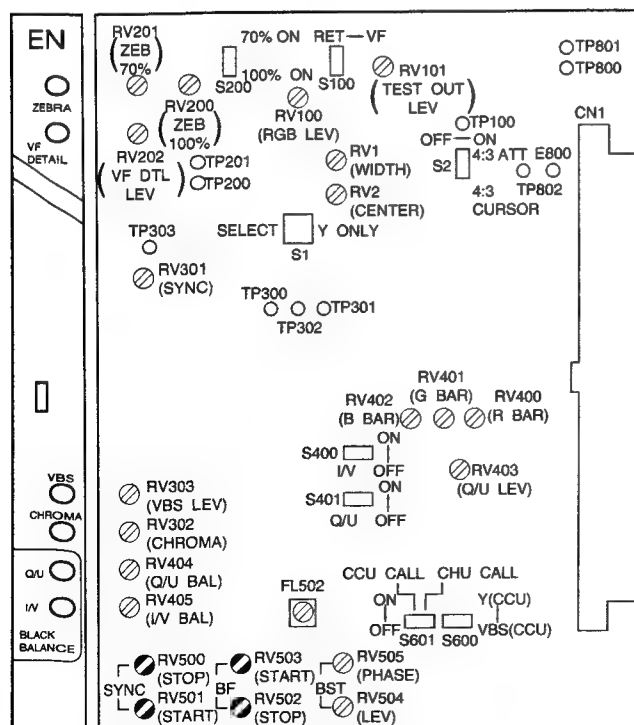
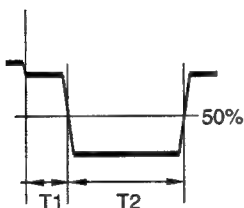
**Test point** : VBS OUT connector

**Adj. point** : ●RV501 (SYNC PHASE) /EN-120 board  
●RV500 (SYNC WIDTH) /EN-120 board

**Specification** : [For NTSC]

$$T1 = 1.5 \pm 0.1 \mu s (\text{ORV501})$$
$$T2 = 4.7 \pm 0.1 \mu s (\text{RV500})$$

[For PAL]

$$T1 = 1.65 \pm 0.1 \mu s (\text{RV501})$$
$$T2 = 4.7 \pm 0.1 \mu s (\text{RV500})$$


## EN-120A/120B/120P BOARD (COMPONENT SIDE)

#### 4-2-8. BF PULSE Adjustment

**Equipment** : Waveform monitor

**To be extended : EN-120 board**

**Test point** : VBS OUT connector

### Adjustment procedure

1. Adj. point : ●RV503 (BF START) /EN-120 board

Specification: [For NTSC]

$$A = 5.3 \pm 0.1 \mu s$$

[For PAL]

$$A = 5.6 \pm 0.1 \mu s$$

2. Adj. point : ●RV502 (BF START) /EN-120 board

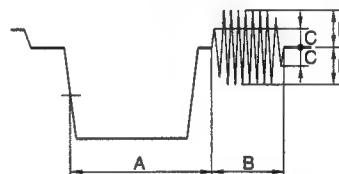
Specification: [For NTSC]

**B = 9 cycles**

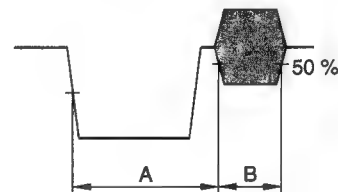
[For PAL]

$$B = 2.25 \pm 0.2 \text{ } \mu\text{s}$$

[For NTSC]



[For PAL]



#### 4-2-9. EN MONITOR GAIN Adjustment

**Equipment** : Waveform monitor

**To be extended** : EN-120 board

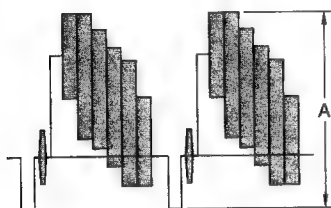
**Preparation:**

- MONITOR select switch/side panel → "ENC"

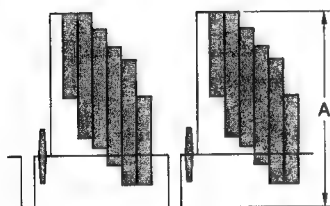
##### Adjustment Procedure

1. Adjust RV101 (TEST OUT LEVEL) /EN-120 board so that the level "A" at MONITOR OUT connector (75  $\Omega$  terminated) is 140 IRE (PAL: 1000 mV).

[For NTSC]



[For PAL]



##### Note:

After the adjustment, set as follows.

- S1/AT-90 board → "D"
- UP/DOWN switch/BVP rear panel → "UP"

#### 4-2-10. EN Gain Adjustment

**Equipment** : Oscilloscope, Waveform monitor

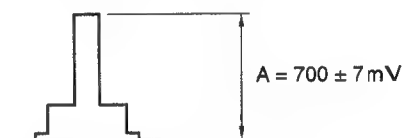
**To be extended** : EN-120 board

**Preparation:**

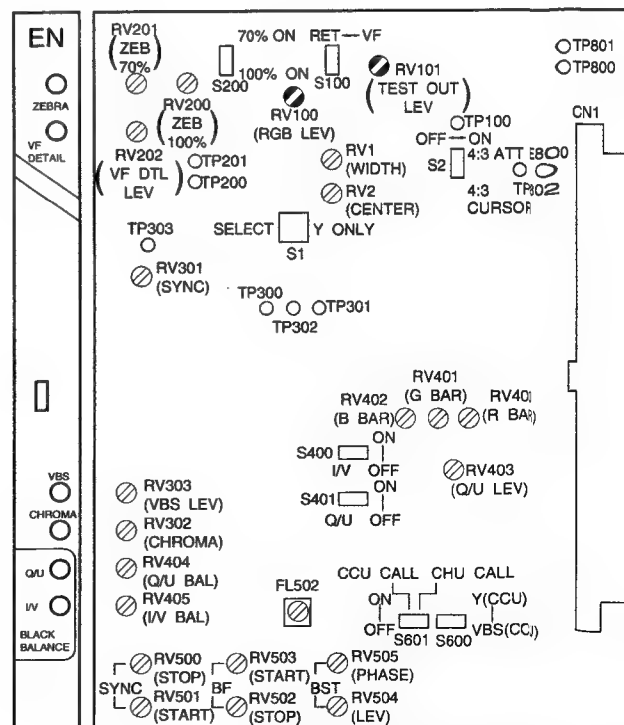
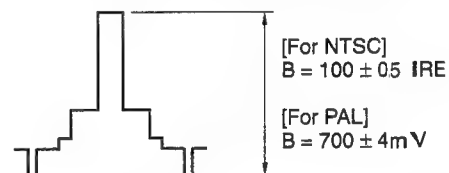
- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"
- Video signal select switch → "G"
- RESPONSE switch/Waveform monitor → "LUM"

##### Adjustment Procedure

1. Adjust G WHITE Level knob or Master Black knob/MSU-700 so that the level "A" at the CN1-pin 44 (GND: pin 43) /extension board is  $700 \pm 7$  mV.
2. Adjust G WHITE Level knob or Master Black knob/MSU-700 so that the level "A" at the CN1-pin 48 (GND: pin 47) /extension board is  $700 \pm 7$  mV.
3. Adjust G WHITE Level knob or Master Black knob/MSU-700 so that the level "A" at the CN1-pin 40 (GND: pin 39) /extension board is  $700 \pm 7$  mV.



4. Adjust RV100 (R/G/B LEVEL) /EN-120 board so that the level "B" at MONITOR OUT connector (75  $\Omega$  terminated) is  $100 \pm 0.5$  IRE (for PAL:  $700 \pm 4$  mV).



EN-120A/120B/120P BOARD (COMPOSITE NT SIDE)

#### 4-2-11. Pedestal Pre-adjustment

**Equipment** : Waveform monitor

**Preparation:**

- CLOSE button/MSU-700 → "ON"
- Video signal select switch/ Camera side panel → "G"
- RESPONSE switch/Waveform monitor → "LOW PASS"

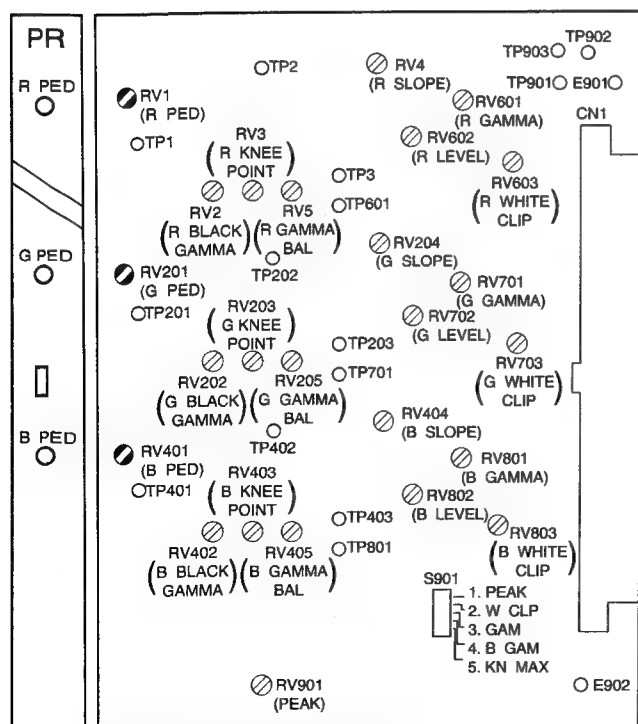
**Test point** : MONITOR OUT connector/camera side panel (75 Ω terminated)

**Adjustment Procedure**

1. Press the BLACK button at AUTO SETUP Block on the MSU-700.
2. Set the adjustment value that is displayed on the display block to "0" with MASTER BLACK control. Make sure that the initial setting are performed so that compensation data for G PED, R PED and B PED are reset.
3. Perform adjustment in order of G, R and B with the video signal select button.

**PR-197 board**

|      | Adj. point    | Specification                       |
|------|---------------|-------------------------------------|
| G-ch | RV201 (G PED) | [For NTSC] 3 IRE<br>[For PAL] 20 mV |
| R-ch | RV1 (R PED)   |                                     |
| B-ch | RV401 (B PED) |                                     |



**PR-197A/197B BOARD (COMPONENT SIDE)**

#### 4-2-12. V MOD Balance Adjustment

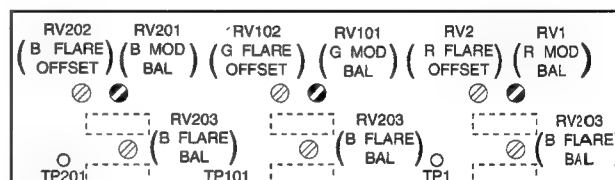
**Equipment** : Waveform monitor

**To be extended** : IE-43 board

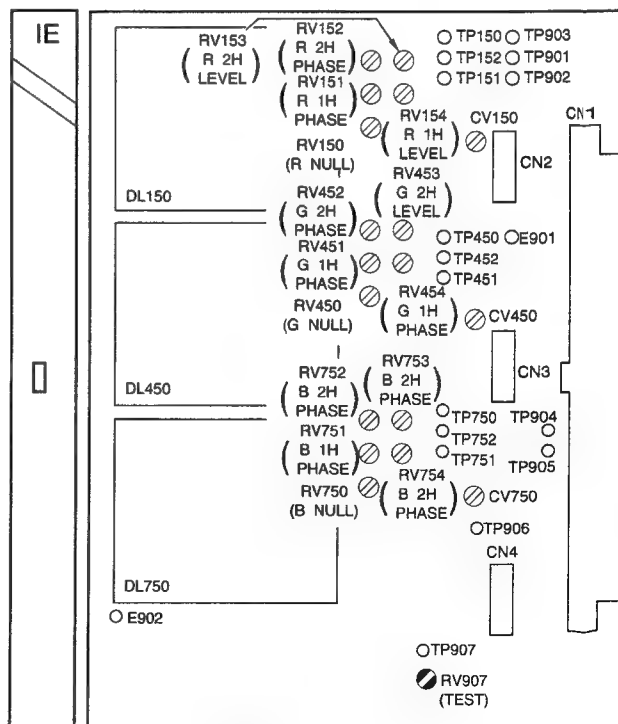
**Preparation:**

- MASTER GAIN select button/MSU-700 → "0"
- CLOSE button/MSU-700 → "ON"
- V MOD button/MSU-700 → "ON"

**Test point** : MONITOR OUT connector (camera side panel)



**IE-46 BOARD (COMPONENT SIDE)**



**IE-43/43P BOARD (COMPONENT SIDE)**



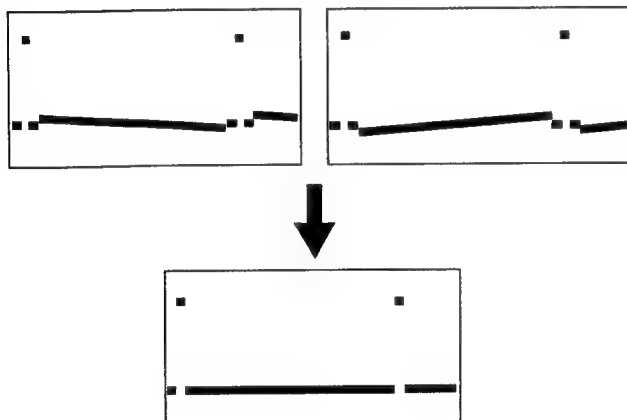
### Adjustment Procedure

1. Press the BLACK button at AUTO SETUP Block on the MSU-700.
2. Perform adjustment in order of G-ch, R-ch and B-ch as follows.

### IE-46 board

|      | Video signal select switch/camera side panel | Adj. point/IE-46 board |
|------|--|------------------------|
| G-ch | G  | RV101 (G MOD BAL)      |
| R-ch | R  | RV1 (R MOD BAL)        |
| B-ch | B  | RV201 (B MOD BAL)      |

**Specification** : Adjust above controls so that the waveform does not change even if the control knob on the MSU-700 is turned fully clockwise or counterclockwise.



### Note:

After the adjustment, set as follows.

- Set all adjustment value that is displayed on the display block to "0" with control knobs.
- V MOD button/MSU-700 → "OFF"

### 4-2-13. TEST Signal Adjustment

**Equipment** : Oscilloscope

**To be extended** : IE-43 board

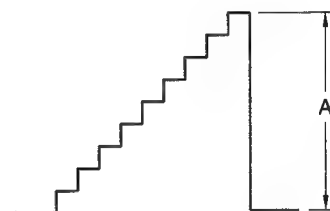
### Preparation:

- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"
- Select the TEST 2 item in CONFIG menu to "10 STEP" with MSU-700 menu operation.
- Remove the IE-46 board from the IE-43 board and install the IE-46 board on the IE-43 board vertically again.

**Test point** : pin 50 (GND:pin 49) /extension board

**Adj. point** : RV907 (TEST LEVEL) /IE-43 board

**Specification** : A = 500 ±5 mV



### Note:

After adjustment, return the TEST 2 item in CONFIG menu "3 STEP" with MSU-700 menu operation.

#### 4-2-14. Pedestal Adjustment

**Equipment** : Waveform monitor

**Preparation:**

- CLOSE button/MSU-700 → "ON"
- Video signal select switch → "G"
- RESPONSE switch/Waveform monitor → "LOW PASS"

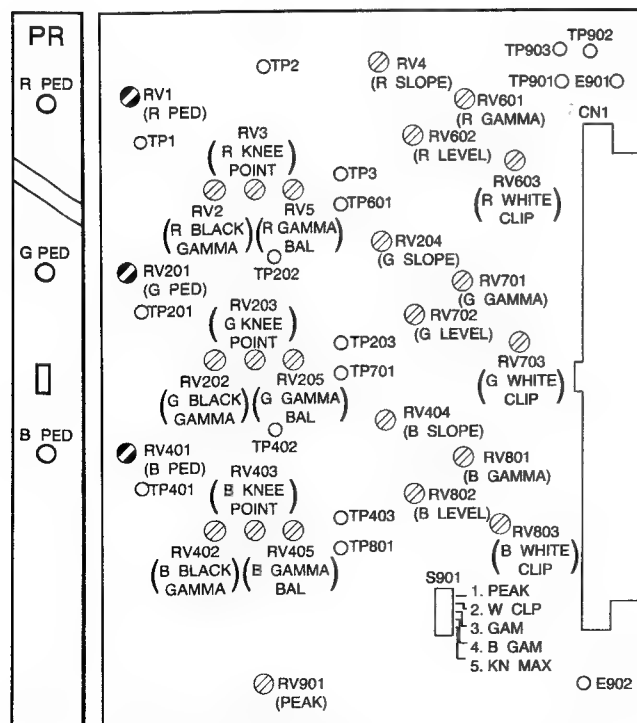
**Test point** : MONITOR OUT connector/camera side panel (75  $\Omega$  terminated)

#### Adjustment Procedure

1. Press the BLACK button at AUTO SETUP block on the MSU-700.
2. Set the adjustment value that is displayed on the display block to "0" with MASTER BLACK control. Make sure that the initial setting are performed so that compensation data for G PED, R PED and B PED are reset.
3. Perform adjustment in order of G, R and B with the video signal select button.

#### PR-197 board

|      | Adj. point    | Specification                       |
|------|---------------|-------------------------------------|
| G-ch | RV201 (G PED) | [For NTSC] 3 IRE<br>[For PAL] 20 mV |
| R-ch | RV1 (R PED)   |                                     |
| B-ch | RV401 (B PED) |                                     |



PR-197A/197B BOARD (COMPONENT SIDE)

#### 4-2-15. Flare Adjustment

**Equipment** : Waveform monitor

**To be extended** : IE-43 board

**Preparation:**

1. CLOSE button/MSU-700 → "ON"  
GAMMA OFF button/MSU-700 → "ON (lamp goes off)"
2. Set adjustment values at R/G/B FLARE to "99" with MSU-700 menu operation.
3. Adjust the following RVs respectively so that the pedestal level at MONITOR OUT connector (camera side panel) does not fluctuate even when FLARE mode is turned ON or OFF with MSU-700 menu operation.
  - RV2 (R FLARE OFFSET) /IE-46 board
  - RV102 (G FLARE OFFSET) /IE-46 board
  - RV202 (B FLARE OFFSET) /IE-46 board
4. CLOSE button/MSU-700 → "OFF"
5. Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.
6. Adjust the iris control so that the video level at MONITOR OUT connector (camera side panel) is 100  $\pm$  2 IRE (for PAL: 700  $\pm$  10 mV).
7. Press the WHITE button at AUTO SETUP block on the MSU-700.

Set adjustment values at R/G/B WHITE respectively so that the video level at MONITOR OUT connector (camera side panel) is 100  $\pm$  2 IRE (for PAL: 700  $\pm$  10 mV) with MSU-700 menu operation (75  $\Omega$  terminated).

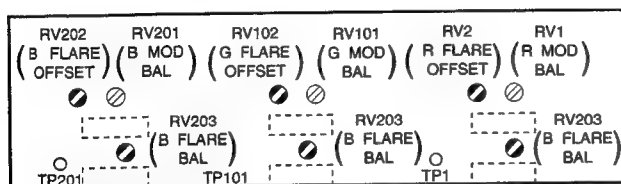
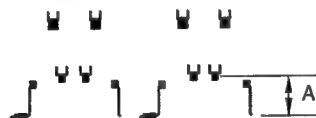
8. Set adjustment values at R/G/B FLARE to "0" with MSU-700 menu operation.
9. Perform adjustment in order of G, R and B with the video signal select button.

#### IE-46 board

|      | Adj. point          |
|------|---------------------|
| G-ch | RV103 (G FLARE BAL) |
| R-ch | RV3 (R FLARE BAL)   |
| B-ch | RV203 (B FLARE BAL) |

#### Adjustment method:

Adjust the following RVs so that the level "A" at MONITOR OUT connector ( camera side panel ) does not fluctuate even when FLARE mode is turned ON or OFF with MSU-700 menu operation.



IE-46 BOARD (COMPONENT SIDE)

#### 4-2-16. IE G/R/B OUT Level Adjustment

**Equipment** : Oscilloscope

**To be extended** : IE-43 board

#### Preparation:

- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"

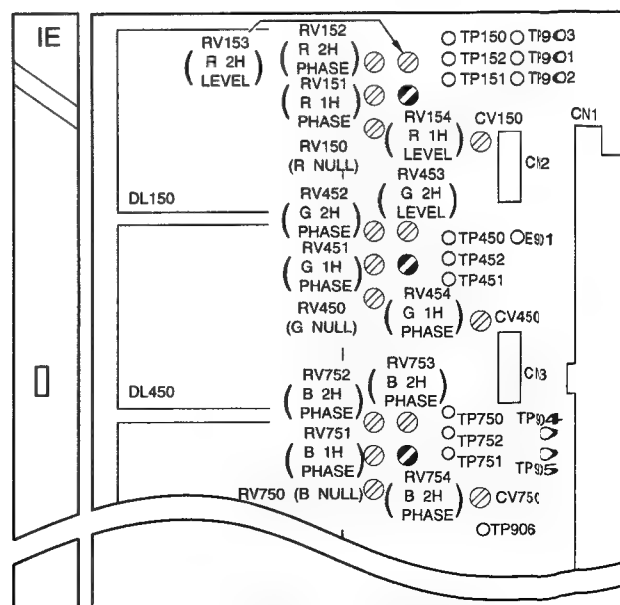
#### Adjustment Procedure

- Perform adjustment in order of G-ch, R-ch and B-ch as follows.

#### IE-43 board

|      | Test point/<br>extension board | Adj. point          |
|------|--------------------------------|---------------------|
| G-ch | CN1-pin 50                     | RV454 (G 1H OFFSET) |
| R-ch | CN1-pin 70                     | RV154 (R 1H OFFSET) |
| B-ch | CN1-pin 30                     | RV754 (B 1H OFFSET) |

**Specification** : Level "A" =  $500 \pm 5$  mV



IE-43/43P BOARD (COMPONENT SIDE)

4-2-17. MX MATRIX OFFSET Adjustment

Equipment : Oscilloscope  
To be extended : MX-58 board

Preparation:

- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"
- MATRIX OFF button/MSU-700 → "ON" (lamp goes off)
- Select the MATRIX Adjustment screen with the MSU-700 menu operation. Set only the USER MATRIX item to "ON".
- Setting MSU-700 menu operation  
R WHITE Adjustment value → "- 99"  
G WHITE Adjustment value → "+ 99"

Adjustment Procedure

- Adjust RV500 (MATRIX OFFSET) /MX-58 board so that the signal waveform at TP201 (GND:E300) / MX-58 board becomes flat.

4-2-18. MX Gain Adjustment

Equipment : Oscilloscope  
To be extended : MX-58 board

Preparation:

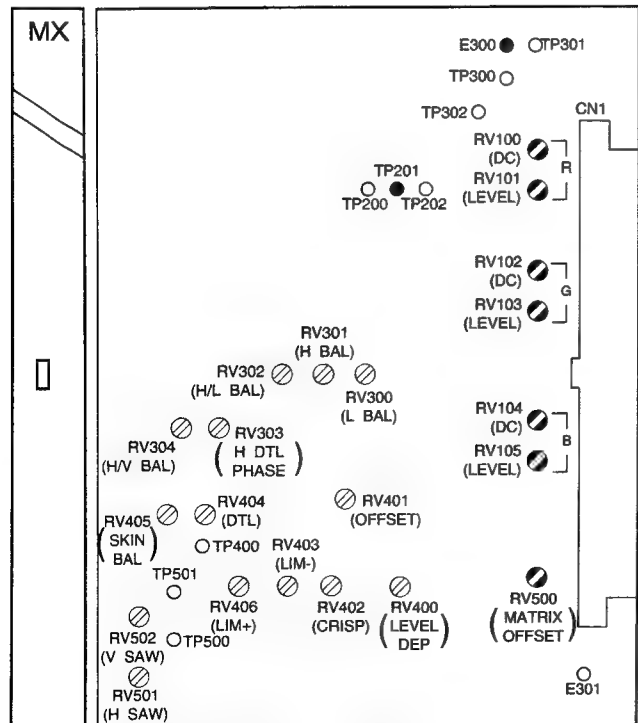
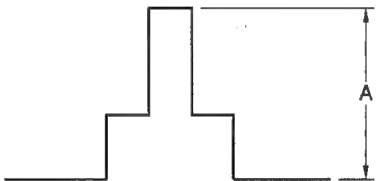
- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"

Adjustment Procedure

- Perform adjustment in order of G-ch, R-ch and B-ch as follows.

MX-58 board

|      | Test point/<br>extension board | Adj. point      | Spec.                |
|------|--------------------------------|-----------------|----------------------|
| G-ch | CN1-pin 50                     | RV103 (G LEVEL) | A =<br>500 ±10 mVp-p |
| R-ch | CN1-pin 70                     | RV101 (R LEVEL) |                      |
| B-ch | CN1-pin 30                     | RV105 (B LEVEL) |                      |



MX-58A/58B/58P BOARD (COMPONENT SIDE)

4-2-19. MX Video DC Balance Adjustment

Equipment : Oscilloscope (DC mode)  
To be extended : MX-58 board

Preparation:

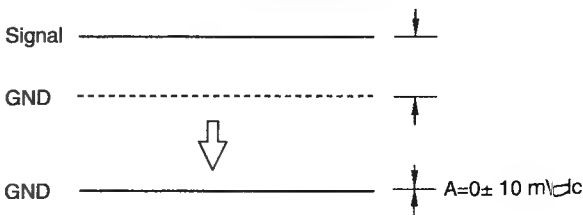
- CLOSE button/MSU-700 → "ON"

Adjustment Procedure

- Perform adjustment in order of G-ch, R-ch and B-ch as follows.

MX-58 board

|      | Test point/<br>extension board | Adj. point   | Spec.             |
|------|--------------------------------|--------------|-------------------|
| G-ch | CN1-pin 50                     | RV100 (G DC) | A =<br>0 ±10 mVdc |
| R-ch | CN1-pin 70                     | RV102 (R DC) |                   |
| B-ch | CN1-pin 30                     | RV104 (B DC) |                   |



#### 4-2-20. PR Gain Adjustment

**Equipment** : Waveform monitor

**To be extended** : PR-197 board

##### Preparation:

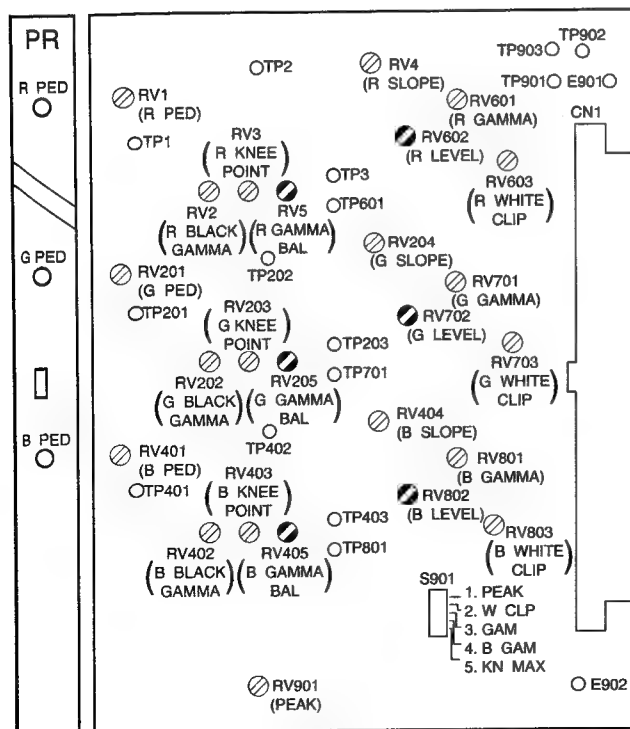
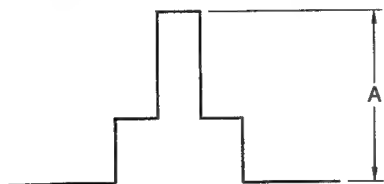
- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"
- KNEE SELECT button/MSU-700 → light up
- Select the WHITE Adjustment screen with the MSU-700 menu operation. Set the WHITE CLIP item to "OFF".

##### Adjustment Procedure

- Perform adjustment in order of G, R and B with the video signal select button.

##### PR-197 board

|      | Test point        | Adj. point     | Spec.                |
|------|-------------------|----------------|----------------------|
| G-ch | MONITOR           | RV602 (R GAIN) | A =<br>700 ±4 mV p-p |
| R-ch | OUT               | RV702 (G GAIN) |                      |
| B-ch | (75 Ω terminated) | RV802 (B GAIN) |                      |



PR-197A/197B BOARD (COMPONENT SIDE)

#### 4-2-21. Gamma Balance Adjustment

**Equipment** : Oscilloscope

**To be extended** : PR-197 board

##### Preparation:

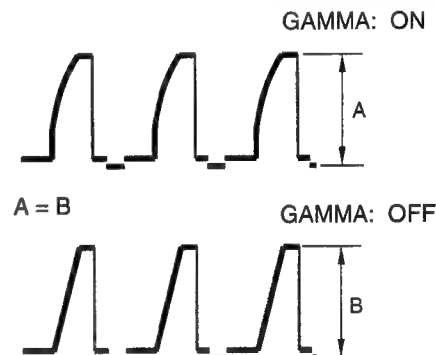
- BARS button/MSU-700 → "OFF"
- TEST 1 button/MSU-700 → "ON"
- GAMMA OFF button/MSU-700 → lamp goes off

##### Adjustment Procedure

Adjust the following RVs so that the peak level of the waveform does not fluctuate even when the GAMMA OFF button on the MSU-700 is turned ON (lamp goes off) or OFF (light up).

##### PR-197 board

|      | Test point/<br>extension board | Adj. point          |
|------|--------------------------------|---------------------|
| G-ch | CN1-pin 50                     | RV205 (G GAMMA BAL) |
| R-ch | CN1-pin 70                     | RV5 (R GAMMA BAL)   |
| B-ch | CN1-pin 30                     | RV405 (B GAMMA BAL) |



##### Note:

After the adjustment, set as follows.

- TEST 1 button/MSU-700 → "OFF"

#### 4-2-22. Gamma Correction Adjustment

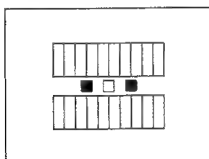
**Equipment** : Waveform monitor

**To be extended** : PR-197 board

**Preparation:**

- Video signal select switch/BVP rear panel → "G"
- RESPONSE switch/Waveform monitor → "LUM"

**Object** : Grayscale chart  
Monitor Screen



**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $100 \pm 2$  IRE (for PAL:  $700 \pm 10$  mV).

**Test point** : MONITOR OUT connector (camera side panel)

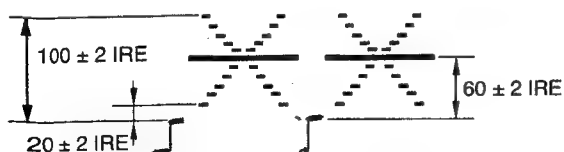
##### Adjustment Procedure

- Before adjustment, select the channel in order of G, R and B with the video signal select button and adjust the peak level at the MONITOR OUT connector to  $100 \pm 2$  IRE (for PAL:  $700 \pm 10$  mV) with iris control and adjust the video level in first step on the gray scale waveform to  $20 \pm 2$  IRE (for PAL:  $140 \pm 10$  mV) with MASTER BLACK control/MSU-700 respectively.

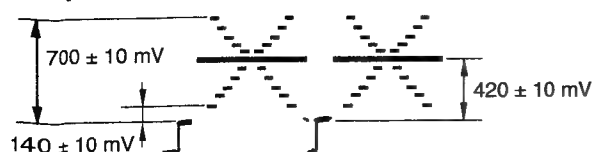
##### PR-197 board

|      | Adj. point      | Specification           |
|------|-----------------|-------------------------|
| G-ch | RV701 (G GAMMA) | Cross point             |
| R-ch | RV601 (R GAMMA) | → [NTSC] $60 \pm 2$ IRE |
| B-ch | RV801 (B GAMMA) | → [PAL] $420 \pm 10$ mV |

[For NTSC]



[For PAL]



#### 4-2-23. Black Gamma Adjustment

**Equipment** : Oscilloscope

**To be extended** : PR-197 board

**Preparation:**

- BARS button/MSU-700 → "OFF"
- TEST 1 button/MSU-700 → "ON"
- S901-4 (BLACK GAMMA ON/OFF) switch/PR-197 board → "ON"

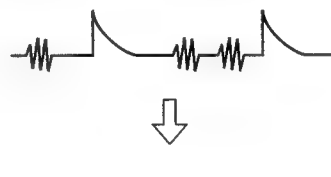
##### Adjustment Procedure

- Perform adjustment in order of G, R and B with the video signal select button.

##### PR-197 board

|      | Test point | Adj. point            |
|------|------------|-----------------------|
| G-ch | TP201      | RV202 (G BLACK GAMMA) |
| R-ch | TP1        | RV2 (R BLACK GAMMA)   |
| B-ch | TP401      | RV402 (B BLACK GAMMA) |

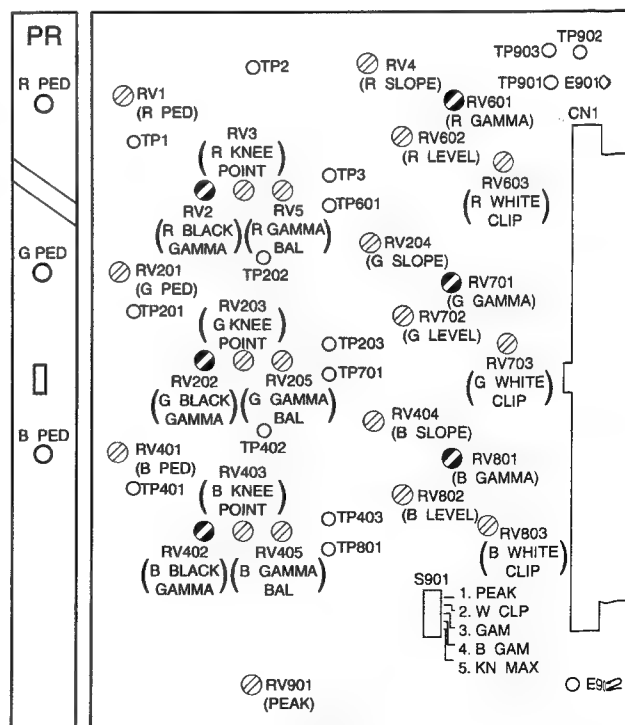
**Specification** : Waveform should be flat



##### Note:

After the adjustment, set as follows.

- TEST 1 button/MSU-700 → "OFF"



PR-197A/197B BOARD (COMPONENT SIDE)

#### 4-2-24. Knee Correction Adjustment

**Equipment** : Waveform monitor

**To be extended** : PR-197 board

**Preparation:**

- BARS button/MSU-700 → "OFF"
- TEST 1 button/MSU-700 → "ON"
- KNEE OFF button/MSU-700 → "ON" (lamp goes off)

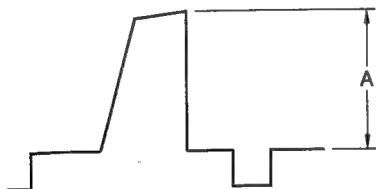
**Test point** : MONITOR OUT connector/  
camera side panel (75 Ω terminated)

#### Adjustment Procedure

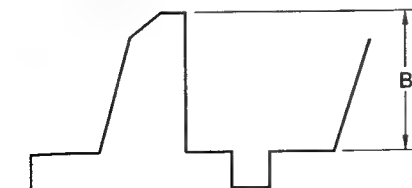
1. AUTO KNEE button/MSU-700 → "OFF" (lamp goes off)  
MASTER GAIN select button/MSU-700 → "6"
2. Select the WHITE Adjustment screen with the MSU-700 menu operation. Set the WHITE CLIP item to "OFF".
3. Select the GAMMA/KNEE Adjustment screen with the MSU-700 menu operation. Set the KNEE item to "ON".
4. Perform adjustment in order of G, R and B with the video signal select button.

#### PR-197 board

|      | Adj. point           | Specification   |
|------|----------------------|---|
| G-ch | RV203 (G KNEE POINT) | [For NTSC] A = $92 \pm 1$ IRE<br>[For PAL] A = $665 \pm 7$ mV |
| R-ch | RV3 (R KNEE POINT)   |   |
| B-ch | RV403 (B KNEE POINT) |   |



5. Select the GAMMA/KNEE Adjustment screen with the MSU-700 menu operation. Set the KNEE item to "OFF".
6. Video signal select button/Camera rear panel → "G"
7. RV204 (G KNEE SLOPE)  
B =  $105 \pm 1$  IRE (for PAL:  $770 \pm 7$  mV)

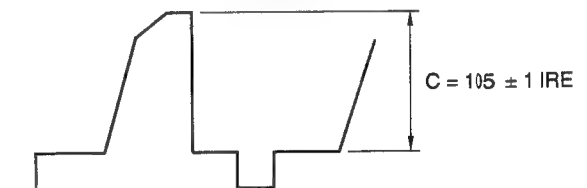


8. Perform adjustment in order of R-ch and B-ch in the same manner as the procedure 7 with the video signal select button.

#### PR-197 board

|      | Adj. point           | Specification                                    |
|------|----------------------|--|
| G-ch | RV4 (R KNEE SLOPE)   | B = $105 \pm 1$ IRE<br>(for PAL: $770 \pm 7$ mV) |
| B-ch | RV404 (B KNEE SLOPE) |  |

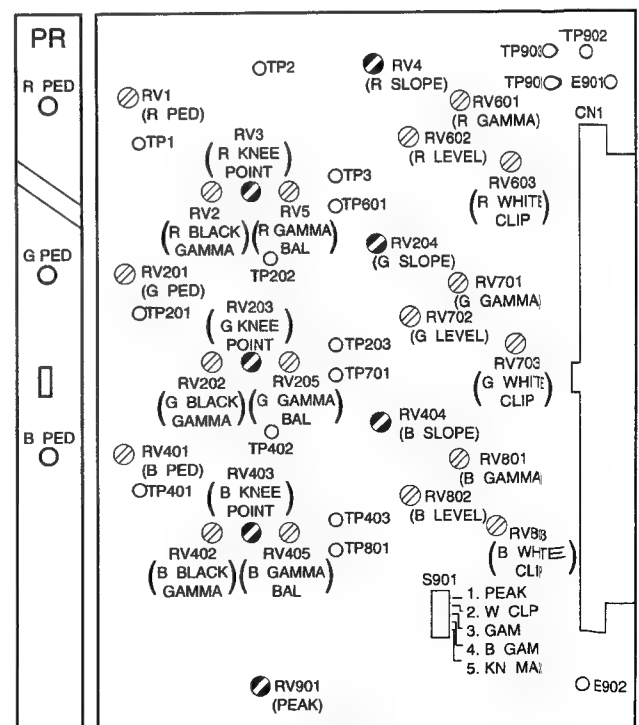
9. MASTER GAIN select button/MSU-700 → "9"  
AUTO KNEE button/MSU-700 → "ON" (light up)  
Video signal select button/Camera rear panel → "G"
10. **Adjustment** : Adjust RV901 (KNEE PEAK) / PR-197 board so that the level "C" is  $105 \pm 1$  IRE (for PAL:  $770 \pm 7$  mV). Otherwise adjust to the preferred level.



#### Note:

After the adjustment, set as follows.

- MASTER GAIN select button/MSU-700 → "0"
- AUTO KNEE button/MSU-700 → "OFF"



PR-197A/197B BOARD (COMPONENT SIDE)

#### 4-2-25. White Clip Adjustment

**Equipment** : Waveform monitor

**To be extended** : PR-197 board

**Preparation:**

- BARS button/MSU-700 → "OFF"
- TEST 1 button/MSU-700 → "ON"
- MASTER GAIN select button/MSU-700 → "18"
- Select the WHITE Adjustment screen with the MSU-700 menu operation. Set the WHITE CLIP item to "ON".

**Test point** : MONITOR OUT connector/  
camera side panel (75  $\Omega$  terminated)

#### Adjustment Procedure

- Perform adjustment in order of G, R and B with the video signal select button.

#### PR-197 board

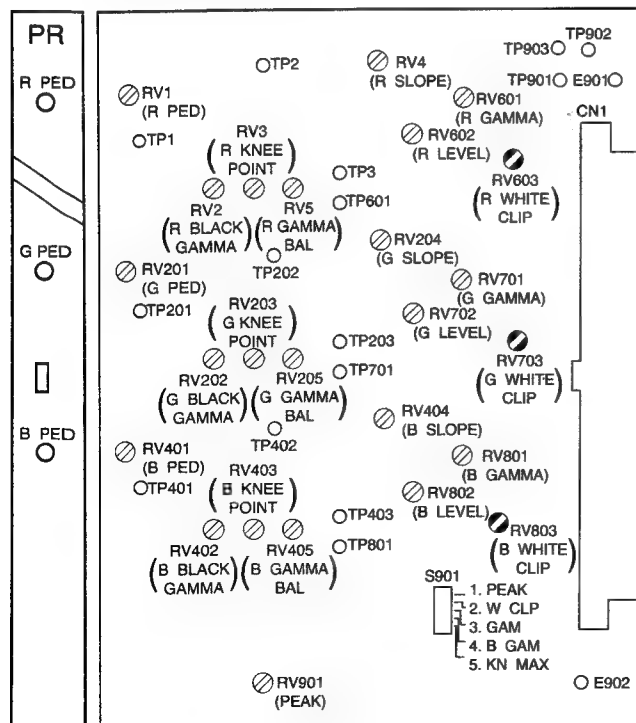
|      | Adj. point         | Specification            |
|------|--------------------|--------------------------|
| G-ch | RV703 (G WHT CLIP) | Peak Level               |
| R-ch | RV603 (R WHT CLIP) | → [NTSC] 105 $\pm$ 1 IRE |
| B-ch | RV803 (B WHT CLIP) | → [PAL] 770 $\pm$ 7 mV   |



#### Note:

After the adjustment, set as follows.

- MASTER GAIN select button/MSU-700 → "0"
- TEST 1 button/MSU-700 → "OFF"



PR-197A/197B BOARD (COMPONENT SIDE)

#### 4-2-26. Spurious Signal Adjustment

#### Note:

- Perform the adjustment only when replacing the following delay lines.
- Perform the adjustment only the channel which has been changed the delay line.  
G-ch → DL450/IE-43 board  
R-ch → DL150/IE-43 board  
B-ch → DL750/IE-43 board

**Equipment** : Oscilloscope

**To be extended** : IE-43 board

**Preparation:**

- CLOSE button/MSU-700 → "ON"

#### Adjustment Procedure

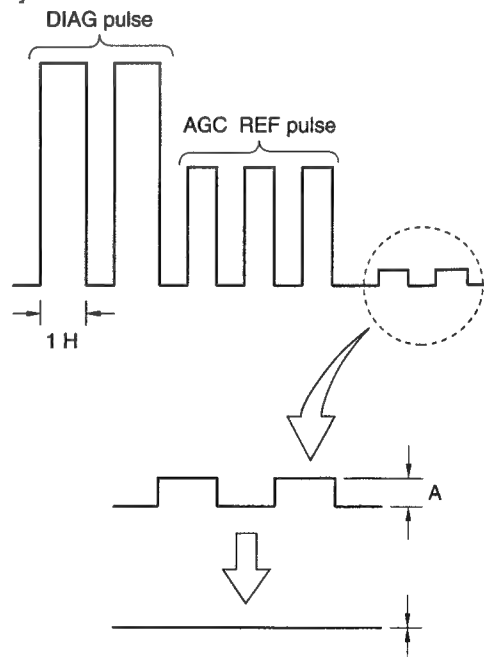
- Perform adjustment in order of G-ch, R-ch and B-ch as follows.

#### IE-43 board

|      | Test point/<br>extension board | Adj. point     |
|------|--------------------------------|----------------|
| G-ch | pin 50 (GND:pin 49)            | RV450 (G NULL) |
| R-ch | pin 70 (GND:pin 69)            | RV150 (R NULL) |
| B-ch | pin 30 (GND:pin 29)            | RV750 (B NULL) |

**Specification** : Make sure that the "A" portion at waveform becomes flat.

[V BLKG]





#### 4-2-27. V DTL NULL Adjustment

**Equipment** : Oscilloscope

**To be extended** : IE-43 board

**Preparation:**

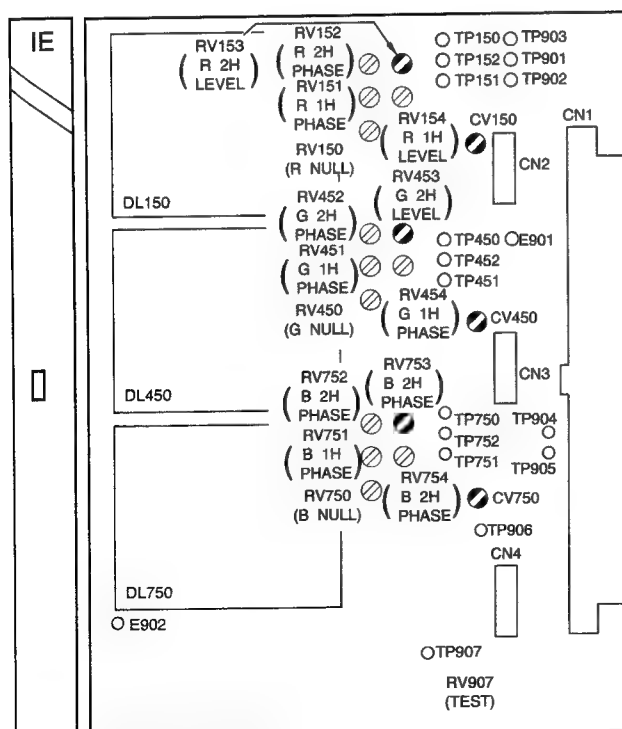
- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"

#### Adjustment Procedure

- Perform adjustment in order of G-ch, R-ch and B-ch as follows.

**IE-43 board (GND: E901)**

|      | Test point | Adj. point          | Spec.              |
|------|------------|---------------------|--------------------|
| G-ch | TP905      | RV453 (G 2H OFFSET) | Waveform<br>→ flat |
| R-ch | TP904      | RV153 (R 2H OFFSET) |                    |
| B-ch | TP906      | RV753 (B 2H OFFSET) |                    |



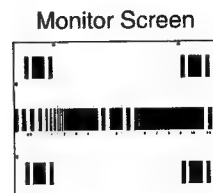
**IE-43/43P BOARD (COMPONENT SIDE)**

#### 4-2-28. IE Frequency Response Adjustment

**Equipment** : Oscilloscope

**To be extended** : IE-43 board

**Object** : Multi-burst chart



**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the 1.0 MHz level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $100 \pm 2$  IRE (for PAL:  $700 \pm 10$  mV).

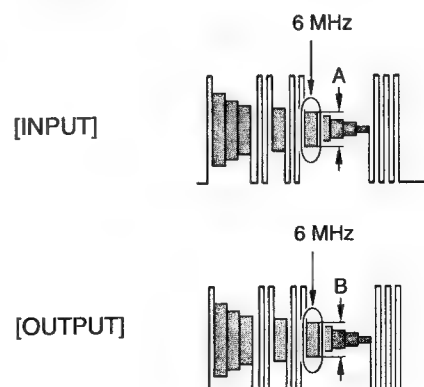
#### Adjustment Procedure

- Perform adjustment in order of G-ch, R-ch and B-ch as follows.
- Adjust the following CVs so that the input level and output level at 6.0 MHz portion are almost equal as shown below.

**IE-43 board**

|      | Test point<br>(Input Signal) | Test point<br>(Output Signal) | Adj. point             |
|------|------------------------------|-------------------------------|------------------------|
| G-ch | TP301/<br>IE-43 board        | pin 50/<br>extension board    | CV450<br>(G FREQ RESP) |
| R-ch | TP1/<br>IE-43 board          | pin 70/<br>extension board    | CV150<br>(R FREQ RESP) |
| B-ch | TP601/<br>IE-43 board        | pin 30/<br>extension board    | CV750<br>(B FREQ RESP) |

**Specification** : A (6 MHz) = B (6 MHz)



#### 4-2-29. G/R/B 1H/2H PHASE Adjustment

##### Note:

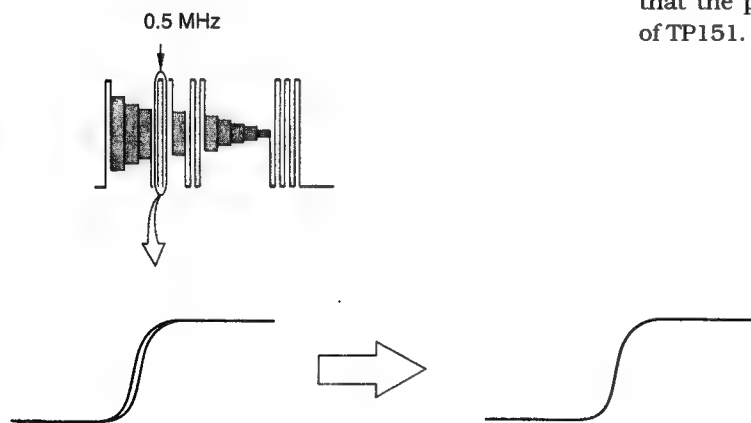
- Perform the adjustment only when replacing the following delay lines.
- Perform the adjustment only the channel which has been changed the delay line.  
R-ch → DL150/IE-43 board  
G-ch → DL450/IE-43 board  
B-ch → DL750/IE-43 board

**Equipment** : Oscilloscope  
**To be extended** : IE-43 board  
**Object** : Multi-burst chart

Monitor Screen



- Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.
- Lens iris** : Adjust the iris control so that the 1.0 MHz level at MONITOR OUT connector /camera side panel (75  $\Omega$  terminated) is  $100 \pm 2$  IRE (for PAL:  $700 \pm 10$  mV).



##### Adjustment Procedure

##### [G-ch]

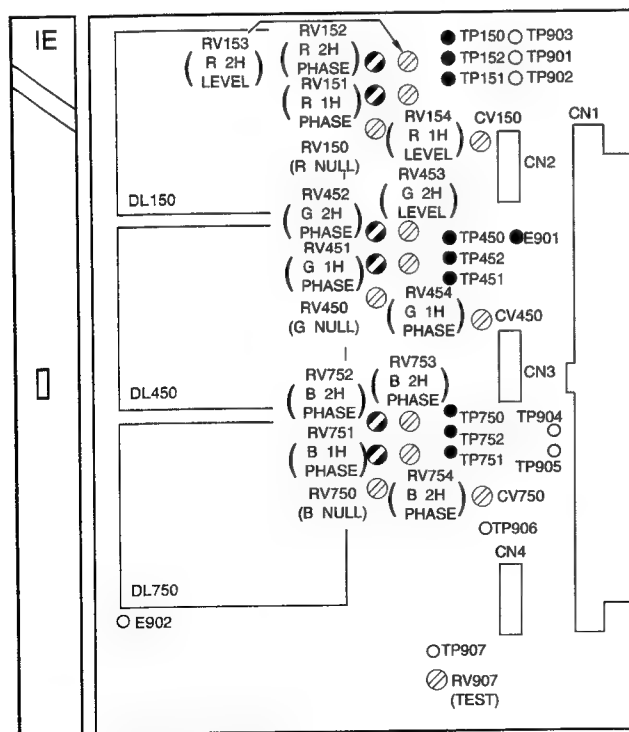
1. Connect the CH-1 probe of oscilloscope to TP451 (GND:E901) /IE-43 board.
2. Connect the CH-2 probe of oscilloscope to TP452 (GND:E901) /IE-43 board.
3. Adjust  $\odot$ RV451 (G 1H PHASE) /IE-43 board so that the phase of TP452 coincides with the phase of TP451.
4. Connect the CH-1 probe of oscilloscope to TP451 (GND:E901) /IE-43 board.
5. Connect the CH-2 probe of oscilloscope to TP450 (GND:E901) /IE-43 board.
6. Adjust  $\odot$ RV452 (G 2H PHASE) /IE-43 board so that the phase of TP450 coincides with the phase of TP451.

##### [R-ch]

1. Connect the CH-1 probe of oscilloscope to TP151 (GND:E901) /IE-43 board.
2. Connect the CH-2 probe of oscilloscope to TP152 (GND:E901) /IE-43 board.
3. Adjust  $\odot$ RV151 (R 1H PHASE) /IE-43 board so that the phase of TP152 coincides with the phase of TP151.
4. Connect the CH-1 probe of oscilloscope to TP151 (GND:E901) /IE-43 board.
5. Connect the CH-2 probe of oscilloscope to TP150 (GND:E901) /IE-43 board.
6. Adjust  $\odot$ RV152 (R 2H PHASE) /IE-43 board so that the phase of TP150 coincides with the phase of TP151.

# [B-ch]

1. Connect the CH-1 probe of oscilloscope to TP751 (GND:E901) /IE-43 board.
2. Connect the CH-2 probe of oscilloscope to TP752 (GND:E901) /IE-43 board.
3. Adjust RV751 (B 1H PHASE) /IE-43 board so that the phase of TP752 coincides with the phase of TP751.
4. Connect the CH-1 probe of oscilloscope to TP751 (GND:E901) /IE-43 board.
5. Connect the CH-2 probe of oscilloscope to TP750 (GND:E901) /IE-43 board.
6. Adjust RV752 (B 2H PHASE) /IE-43 board so that the phase of TP750 coincides with the phase of TP751.



IE-43/43P BOARD (COMPONENT SIDE)

## 4-2-30. H DTL Balance Adjustment

Equipment : Waveform monitor

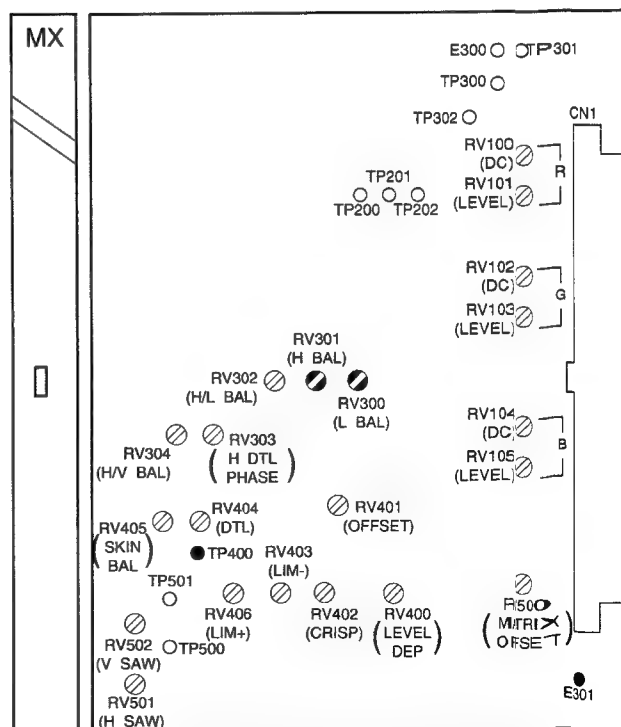
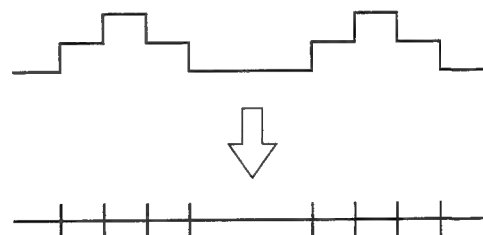
To be extended : MX-58 board

### Preparation:

- TEST 2 button/MSU-700 → "ON"
  - DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Test point : TP400 (GND: E301) /MX-58 board

### Adjustment Procedure

1. Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of H/L BAL to "+99".
2. Adjust RV301 (HF BAL) /MX-58 board alternately so that the waveform at TP400 (GND: E301) /MX-58 board is flat.
3. Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of H/L BAL to "-99".
4. Adjust RV300 (LF BAL) /MX-58 board alternately so that the waveform at TP400 (GND: E301) /MX-58 board is flat.



MX-58A/58B/58P BOARD (COMPONENT SIDE)

#### 4-2-31. HF/LF DTL Balance Adjustment

**Equipment** : Waveform monitor

**To be extended** : MX-58 board

**Preparation:**

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select button/BVP rear panel → "G"
- LINE SELECTOR/Waveform monitor → "VAR"

**Object** : Multi-burst chart

Monitor Screen



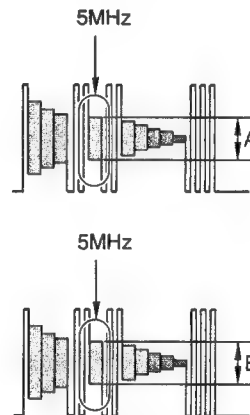
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the 1.0 MHz level at MONITOR OUT connector /camera side panel (75  $\Omega$  terminated) is 100  $\pm$ 2 IRE (for PAL: 700  $\pm$ 10 mV).

**Test point** : MONITOR OUT connector (camera side panel)

#### Adjustment Procedure

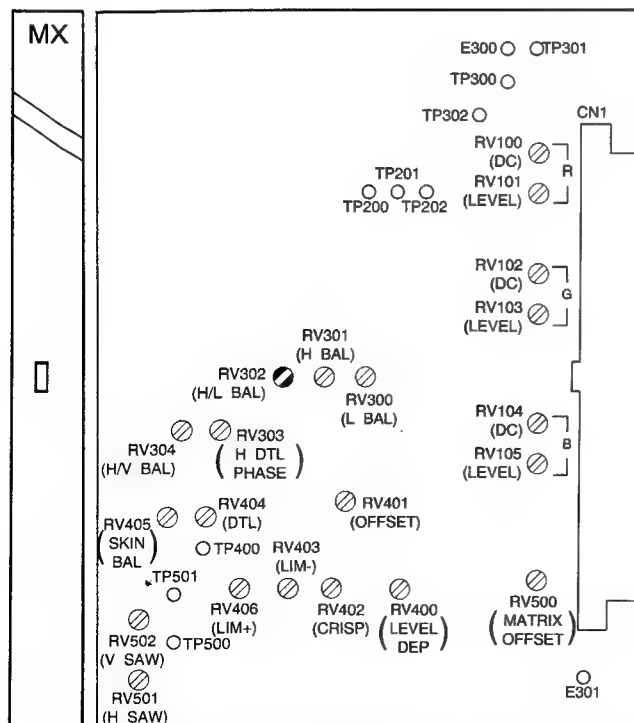
1. Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of H/L BAL to "-99".
2. Measure the detail level "A" at 5 MHz of multi-burst waveform.
3. Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of H/L BAL to "+99".
4. Measure the detail level "B" at 5 MHz of multi-burst waveform.
5. Adjust  $\text{RV302}$  (HF/LF BAL) /MX-58 board so that the levels "A" and "B" are equal even when the HF/LF DETAIL are set according to any setting of procedures 1 or 3.



#### Note:

After the adjustment, set as follows.

- Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of DETAIL FREQ to "0".



MX-58A/58B/58P BOARD (COMPONENT SIDE)

#### 4-2-32. DC Offset Adjustment

**Equipment** : Waveform monitor

**To be extended** : MX-58 board

##### Preparation:

- CLOSE button/MSU-700 → "ON"
- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Setting of MSU-700 Menu operation  
DETAIL Level → "+99 %"
- Set the waveform monitor as follows.  
RESPONSE mode: "LUM"  
VOLTS FULL SCALE mode: "0.2"

##### Adjustment Procedure

1. Observe the waveform monitor screen and adjust the MASTER BLACK control knob/MSU-700 so that the pedestal level is 5 IRE (for PAL: 5 %).
2. Observe the waveform monitor screen and adjust RV401 (DC OFFSET) /MX-58 board so that the pedestal level does not fluctuate even when the DETAIL OFF button/MSU-700 is turned ON or OFF.

#### 4-2-33. Level Dependent Adjustment

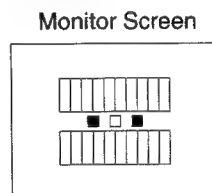
**Equipment** : Waveform monitor

**To be extended** : MX-58 board

##### Preparation:

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select switch → "G"

**Object** : Grayscale chart



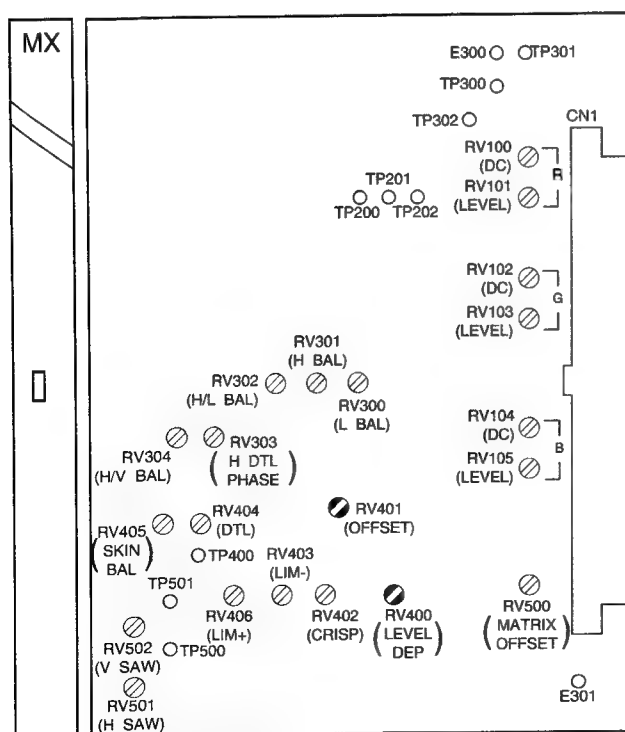
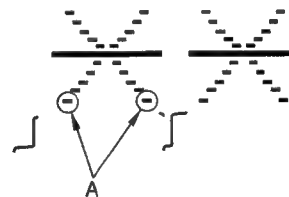
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $90 \pm 2$  IRE (for PAL:  $650 \pm 10$  mV).

**Test point** : MONITOR OUT connector (camera side panel)

##### Adjustment Procedure

- Turn RV400 (LEVEL DEPENDENT) /MX-58 board from the leftmost position clockwise slowly and stop where the spikes portion "A" start to decrease.



**MX-58A/58B/58P BOARD (COMPONENT SIDE)**

#### 4-2-34. Crispening Adjustment

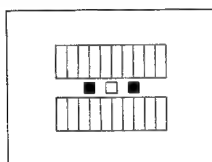
**Equipment** : Waveform monitor

**To be extended** : MX-58 board

**Preparation:**

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select switch → "G"

**Object** : Grayscale chart  
Monitor Screen



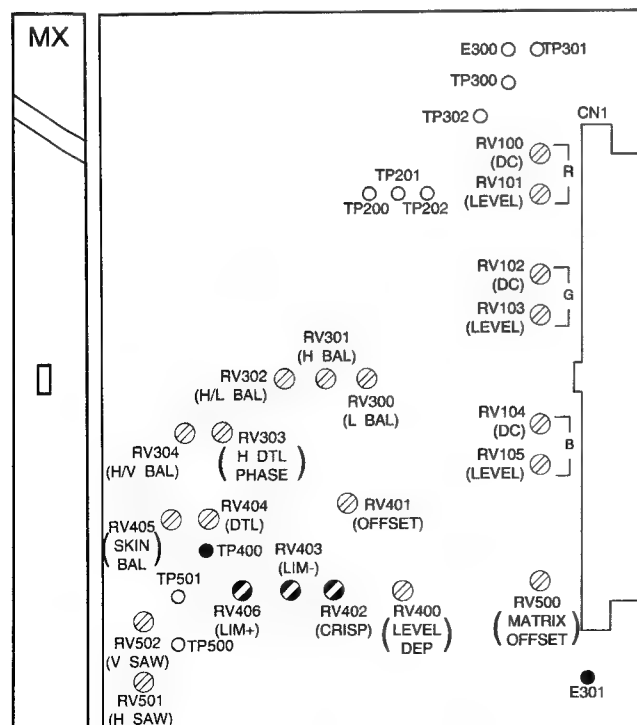
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $90 \pm 2$  IRE (for PAL:  $650 \pm 10$  mV).

**Test point** : MONITOR OUT connector (camera side panel)

#### Adjustment Procedure

- Observe the waveform monitor and turn  $\odot$ RV402 (CRISPENING) /MX-58 board clockwise until the noise on the black areas of the picture just starts to be reduced. Otherwise adjust to the preferred level.



MX-58A/58B/58P BOARD (COMPONENT SIDE)

#### 4-2-35. DTL Limiter Adjustment

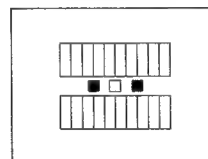
**Equipment** : Waveform monitor

**To be extended** : MX-58 board

**Preparation:**

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select switch → "G"

**Object** : Grayscale chart  
Monitor Screen



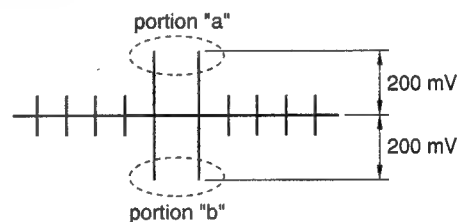
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $90 \pm 2$  IRE (for PAL:  $650 \pm 10$  mV).

**Test point** : TP400 (GND: E301) /MX-58 board

#### Adjustment Procedure

1. Set the level at the portion "a" to 200 mV by using  $\odot$ RV406 (LIMITER +) /MX-58 board.
2. Set the level at the portion "b" to 200 mV by using  $\odot$ RV403 (LIMITER -) /MX-58 board.



#### 4-2-36. H DTL PHASE Adjustment

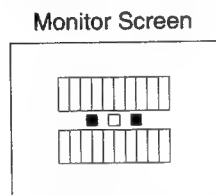
**Equipment** : Waveform monitor

**To be extended** : MX-58 board

**Preparation:**

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select switch → "ALL OFF"

**Object** : Grayscale chart



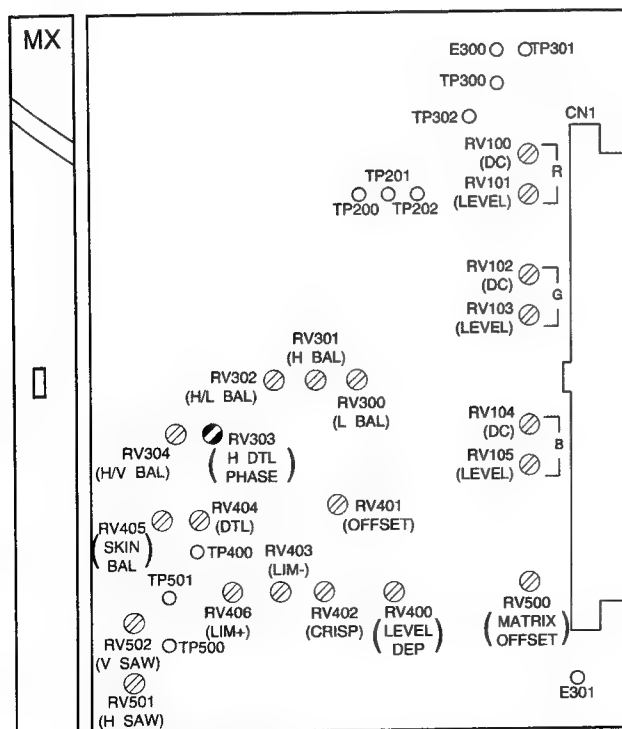
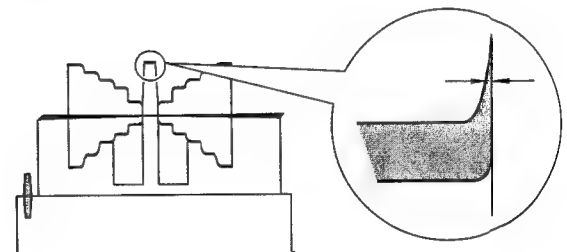
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $90 \pm 2$  IRE (for PAL:  $650 \pm 10$  mV).

**Test point** : MONITOR OUT connector (camera side panel)

#### Adjustment Procedure

1. Press the WHITE button of AUTO SETUP block on the MSU-700.
2. Set the waveform monitor to "LINE SELECT" mode.
3. Select the line at the center of the center white square in the grayscale pattern.
4. Adjust  $\odot$ RV303 (H DTL PHASE) /MX-58 board so that the both edges of the center white square are equal.



MX-58A/58B/58P BOARD (COMPONENT SIDE)

#### 4-2-37. H/V RATIO Adjustment

**Equipment** : Waveform monitor, B/W monitor

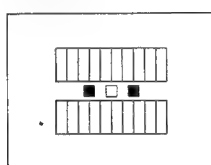
**To be extended** : MX-58 board

**Preparation:**

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select switch → "G"
- Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of DETAIL LIMITER to "-99".

**Object** : Grayscale chart

Monitor Screen



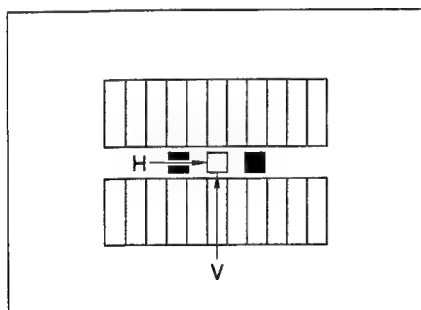
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $90 \pm 2$  IRE (for PAL:  $650 \pm 10$  mV).

**Test point** : B/W monitor

#### Adjustment Procedure

- Adjust  $\odot$ RV304 (H/V BAL) /MX-58 board so that both horizontal and vertical detail levels are equal.



#### 4-2-38. DTL Gain Adjustment

**Equipment** : Waveform monitor, B/W monitor

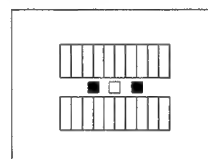
**To be extended** : MX-58 board

**Preparation:**

- DETAIL OFF button/MSU-700 → "ON" (lamp goes off)
- Video signal select button/Camera rear panel → "G"

**Object** : Grayscale chart

Monitor Screen



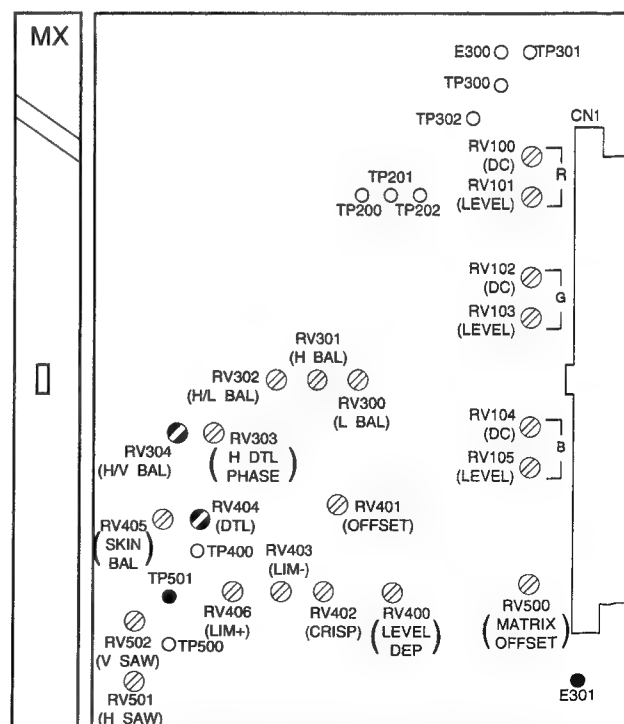
**Lens zoom** : Adjust the zoom control of the lens so that the chart frame matches the underscanned monitor frame.

**Lens iris** : Adjust the iris control so that the video level at MONITOR OUT connector/camera side panel (75  $\Omega$  terminated) is  $90 \pm 2$  IRE (for PAL:  $650 \pm 10$  mV).

**Test point** : B/W monitor screen

#### Adjustment Procedure

- Adjust  $\odot$ RV404 (DTL GAIN) /MX-58 board so that the detail levels at TP400 (GND: E301) /MX-58 board and pin 14 (GND: pin 13) /extension board are equal.



MX-58A/58B/58P BOARD (COMPONENT SIDE)



#### 4-2-39. Skin Tone Adjustment

**Equipment** : Color monitor, oscilloscope

**To be extended** : MX-58 board

**Preparation:**

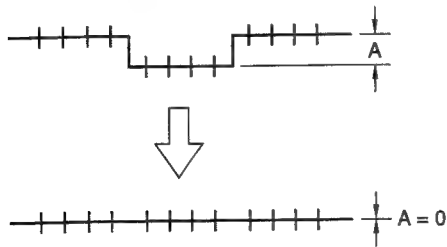
- SKIN DETAIL button/MSU-700 → "ON"  
SKIN DETAIL AUTO HUE button/MSU-700 → "OFF"
- Select the SKIN DETAIL Adjustment screen with the MSU-700 menu operation. Set the SKIN GATE to "ON".

**Test point** : PIX 1 OUT connector/CCU rear panel

**Adjusting point** : ⚙RV405 (SKIN BAL) /MX-58 board

##### Adjustment Procedure

1. Select the DETAIL Adjustment screen with the MSU-700 menu operation. Set the adjustment value of DETAIL LEVEL to "0".
2. Shoot the object that has more than two colors. Add the skin tone detail to the one color portion.
3. Adjust ⚙RV405 (SKIN BAL) /MX-58 board so that the difference in level at pin 18 (GND: pin 17) / extension board is disappeared. (A = 0)



#### 4-2-40. VCO DC SET Adjustment

**Note:**

- Before adjustment, allow for more than 10 minutes warm-up time.
- Use the video signal generator that sub-carrier frequency is the following frequency as possible.  
[for NTSC] 3.579545 MHz  $\pm$ 3 Hz  
[for PAL] 4.433618 MHz  $\pm$ 3 Hz

**Equipment** : Oscilloscope, Video signal generator

**To be extended** : MD-99 board

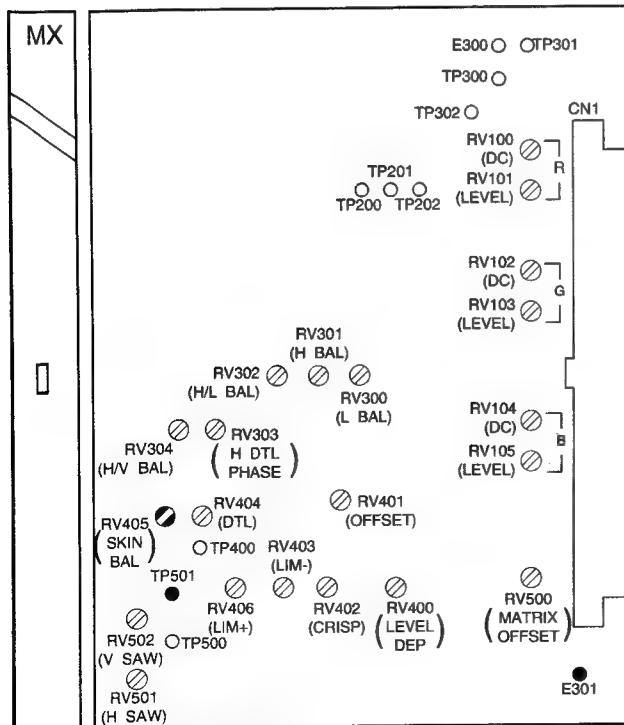
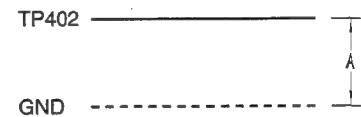
**Preparation:**

- Feed the Black Burst signal from the video signal generator to REFERENCE IN connector on CCU rear panel. And terminate the another REFERENCE IN connector on CCU rear panel with 75  $\Omega$  resistor.

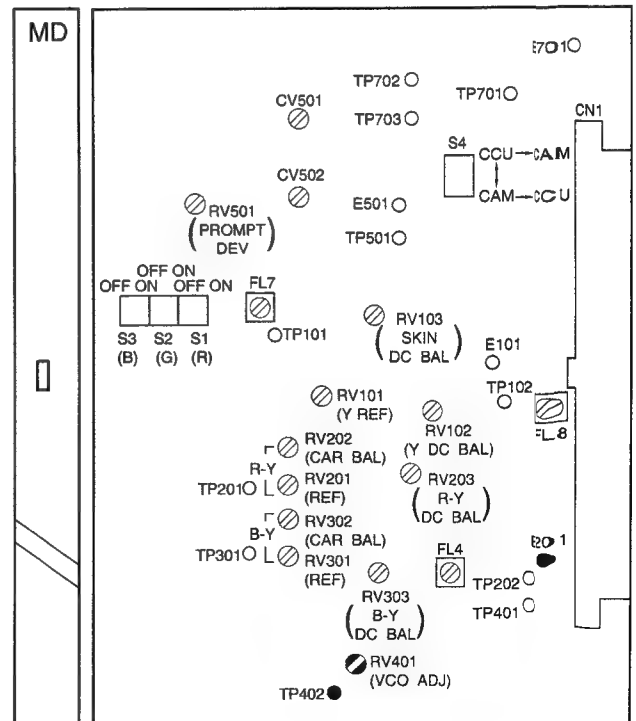
**Test point** : TP402 (GND: E201) /MD-99 board

**Adjusting point** : ⚙RV401 (VCO ADJ) /MD-99 board

**Specification** : A = 2.00  $\pm$ 0.03 V dc



MX-58A/58B/58P BOARD (COMPONENT SIDE)



MD-99 BOARD (COMPONENT SIDE)

#### 4-2-41. Y REF Level Adjustment

##### Note:

Make sure that the adjustment of "ENCODER SYSTEM ADJUSTMENT" through "DETAIL SIGNAL SYSTEM ADJUSTMENT" must be done.

**Equipment** : Oscilloscope

**To be extended** : MD-99 board

##### Preparation:

1. Button switches of MSU-700 must be set the initial setting. (Refer to 4-1-4. Initial setting.)
2. BARS button/MSU-700 → "OFF"  
TEST 2 button/MSU-700 → "ON"  
KNEE OFF button/MSU-700 → "OFF" (light up)

**Test point** : TP101 (GND:E101) /MD-99 board

**Trigger** : SYNC OUT connector/CCU rear panel

**Adjusting point** : RV101 (Y REF) /MD-99 board

**Specification** :  $A = 0 \pm 2 \text{ mV}$



#### 4-2-42. Y/SKIN DC Balance Adjustment

**Equipment** : Oscilloscope

**To be extended** : MD-99 board

**Test point** : TP102 (GND: E101) /MD-99 board

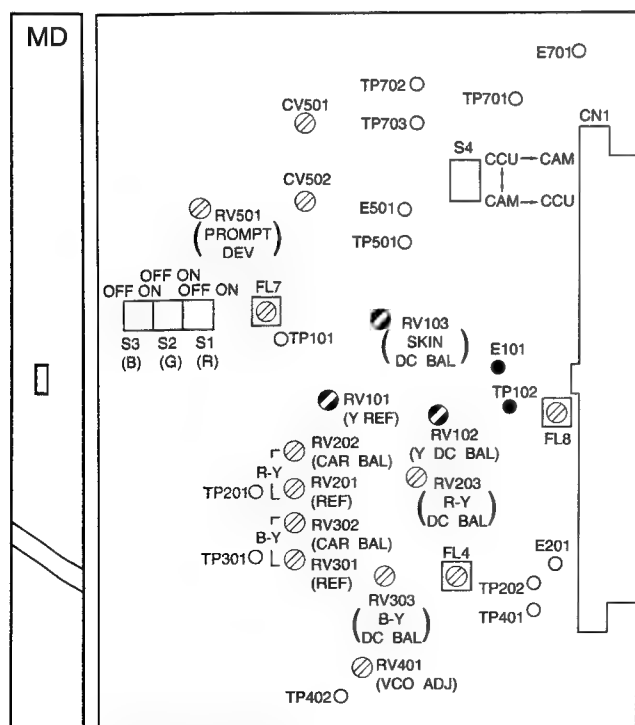
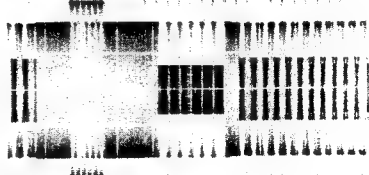
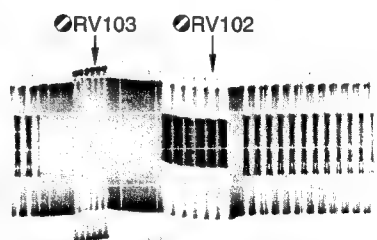
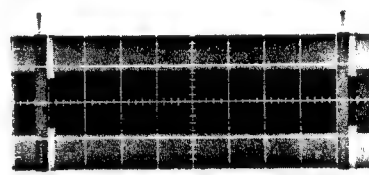
**Trigger** : SYNC OUT connector/CCU rear panel

**Adjusting point** : RV102 (Y DC BAL) /MD-99 board

RV103 (SKIN DC BAL) /MD-99 board

##### Adjustment Procedure

1. Adjust RV102 (Y DC BAL) /MD-99 board so that the waveform at TP102 is flat in V BLKG period.
2. Adjust RV103 (SKIN DC BAL) /MD-99 board so that the waveform at TP102 is flat in V BLKG period.
3. Repeat procedures 1 and 2 until the specifications of procedures 1 and 2 are met.



MD-99 BOARD (COMPONENT SIDE)

#### 4-2-43. Y/SKIN 90° Adjustment

##### Note:

Perform this adjustment only when replacing  $\Phi$ FL7/MD-99 board.

**Equipment** : Oscilloscope

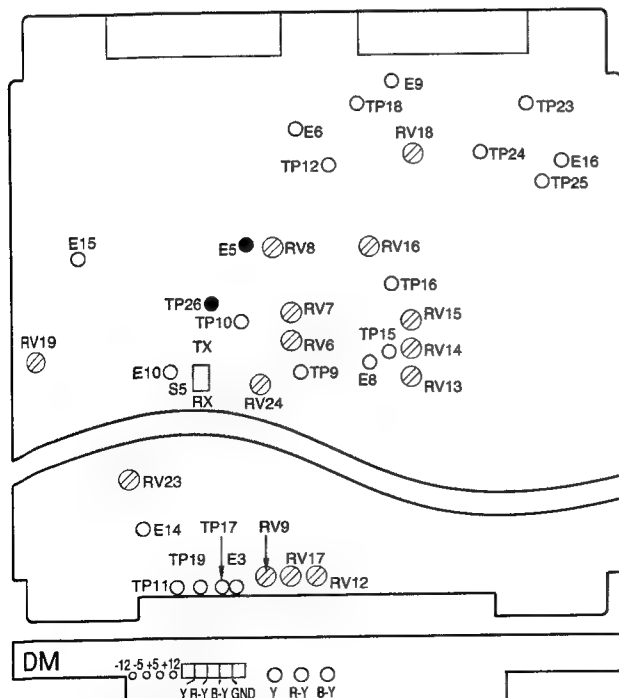
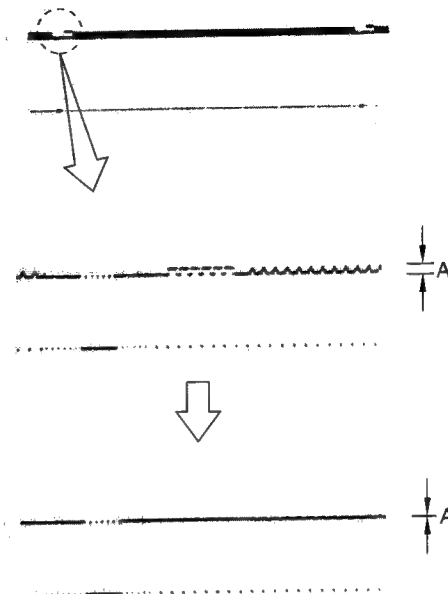
**To be extended** : MD-99 board (BVP-750/750P)  
DM-94 board (CCU-700/700P)

**Test point** : TP26 (GND: E5) /DM-94 board  
(CCU-700/700P)

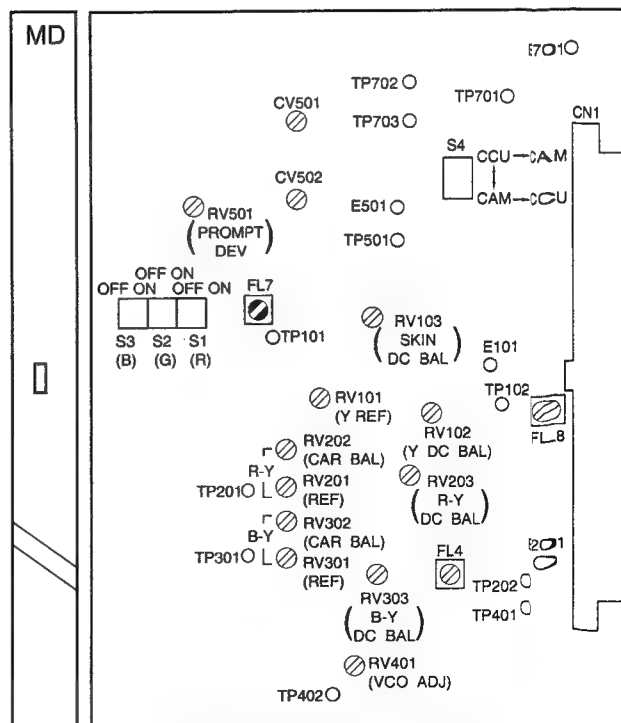
**Trigger** : SYNC OUT connector/CCU rear panel

**Adjusting point** :  $\Phi$ FL7/MD-99 board

**Specification** :  $A = 0 \pm 2 \text{ mV}$



DM-94 BOARD /CCU-700 (COMPONENT SIDE)



MD-99 BOARD (COMPONENT SIDE)

#### 4-2-44. R-Y REF Level Adjustment

**Equipment** : Oscilloscope

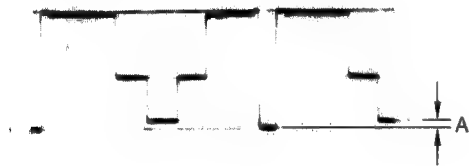
**To be extended** : MD-99 board

**Preparation:**

- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"
- KNEE OFF button/MSU-700 → "OFF" (light up)
- S1 (R ON/OFF) /MD-99 board → "OFF"

##### Adjustment Procedure

1. **Test point** : TP201 (GND: E201) /MD-99 board  
**Adj. point** : RV201 (R-Y REF) /MD-99 board  
**Specification** :  $A = 0 \pm 2 \text{ mV}$



##### Note:

After the adjustment, set as follows.

- TEST 2 button/MSU-700 → "OFF"
- S1 (R ON/OFF) /MD-99 board → "ON"

#### 4-2-45. B-Y REF Level Adjustment

**Equipment** : Oscilloscope

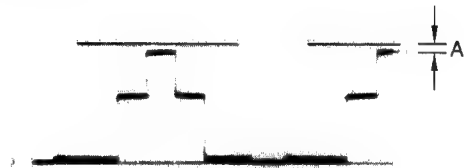
**To be extended** : MD-99 board

**Preparation:**

- BARS button/MSU-700 → "OFF"
- TEST 2 button/MSU-700 → "ON"
- KNEE OFF button/MSU-700 → "OFF" (light up)
- S1 (R ON/OFF) /MD-99 board → "OFF"
- S2 (G ON/OFF) /MD-99 board → "OFF"

##### Adjustment Procedure

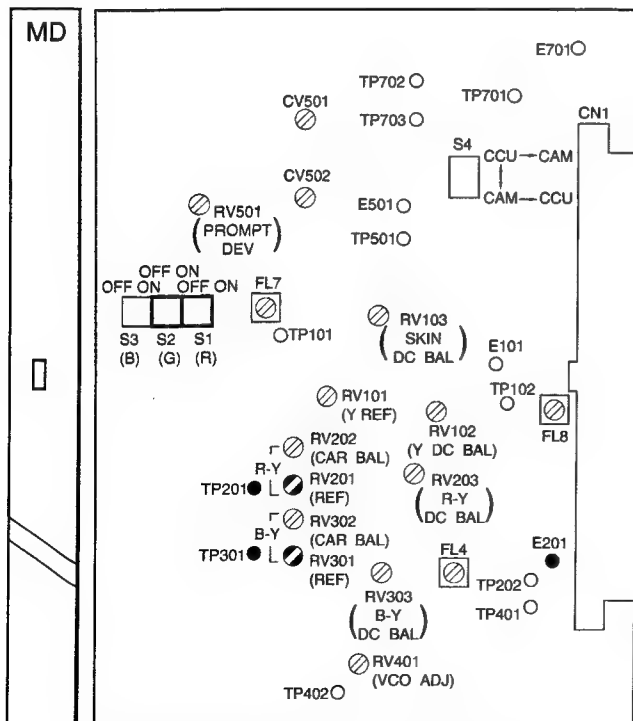
1. **Test point** : TP301 (GND: E201) /MD-99 board  
**Adj. point** : RV301 (B-Y REF) /MD-99 board  
**Specification** :  $A = 0 \pm 2 \text{ mV}$



##### Note:

After the adjustment, set as follows.

- TEST 2 button/MSU-700 → "OFF"
- S1 (R ON/OFF) /MD-99 board → "ON"
- S2 (G ON/OFF) /MD-99 board → "ON"



MD-99 BOARD (COMPONENT SIDE)

#### 4-2-46. R-Y/B-Y Carrier Balance Adjustment

**Equipment** : Oscilloscope  
**To be extended** : MD-99 board

##### Preparation:

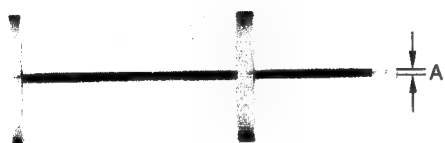
- CLOSE button/MSU-700 → "ON"

**Test point** : TP202 (GND: E201) /MD-99 board

**Adjusting point** : ⚙RV202 (R-Y CARR BAL) /MD-99 board  
 ⚙RV302 (B-Y CARR BAL) /MD-99 board

##### Adjustment Procedure

- Adjust ⚙RV202 and ⚙RV302 alternately so that the amplitude "A" is minimum.



#### 4-2-47. R-Y/B-Y DC Balance Adjustment

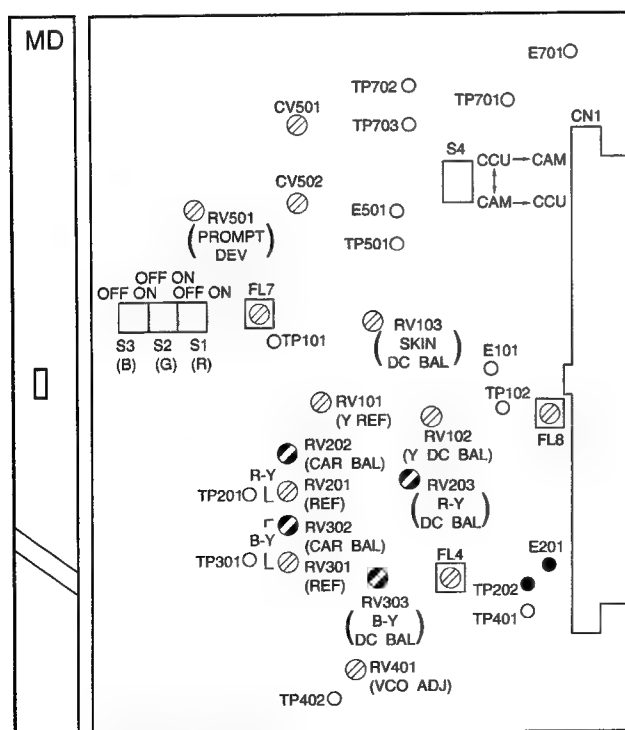
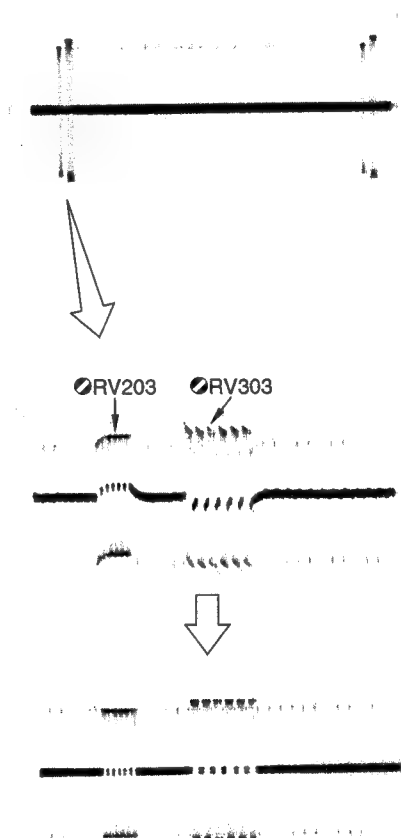
**Equipment** : Oscilloscope  
**To be extended** : MD-99 board

**Test point** : TP202 (GND: E201) /MD-99 board

**Adjusting point** : ⚙RV203 (R-Y DC BAL) /MD-99 board  
 ⚙RV303 (B-Y DC BAL) /MD-99 board

##### Adjustment Procedure

- Adjust ⚙RV203 and ⚙RV303 alternately so that the waveform is flat.



MD-99 BOARD (COMPONENT SIDE)

#### 4-2-48. R-Y/B-Y 90° Adjustment

##### Note:

Perform the adjustment only when replacing  $\Phi$ FL4/MD-99 board.

**Equipment** : Oscilloscope (DC mode)

**To be extended** : MD-99 board (BVP-750/750P)  
DM-94 board (CCU-700/700P)

**Test point** : TP14 (GND: E12) /DM-94 board  
(CCU-700/700P)

**Adjusting point** :  $\Phi$ FL4/MD-99 board

##### Adjustment Procedure

- Adjust  $\Phi$ FL4/MD-99 board so that TP14 (GND: E12) on the DM-94 board (CCU-700/700P) is minimum DC level.



#### 4-2-49. 67.5MHz TRAP Adjustment

##### Note:

Perform the adjustment only when replacing  $\Phi$ FL8 (67.5MHz TRAP) /MD-99 board.

**Equipment** : Spectrum analyzer

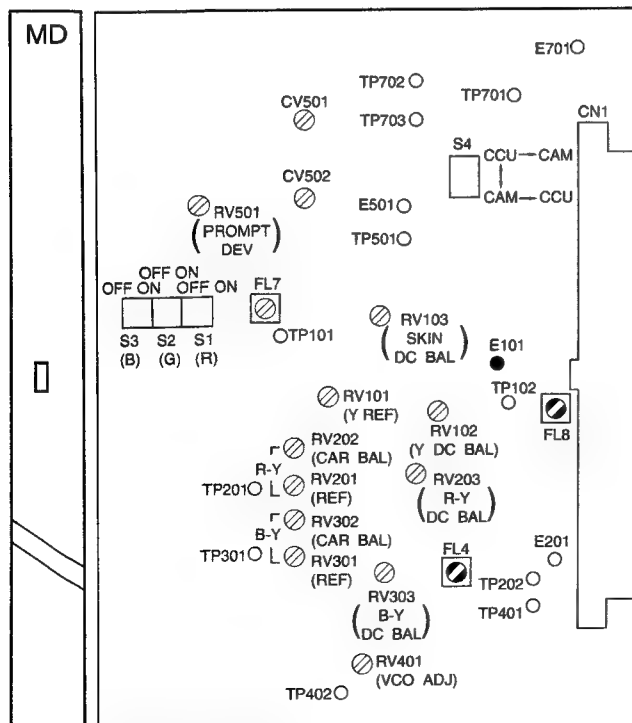
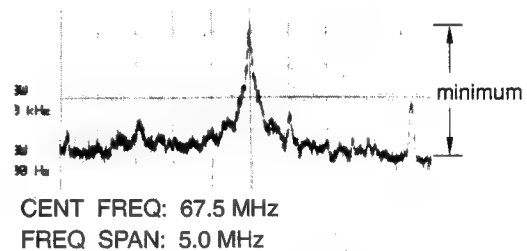
**To be extended** : MD-99 board

##### Preparation:

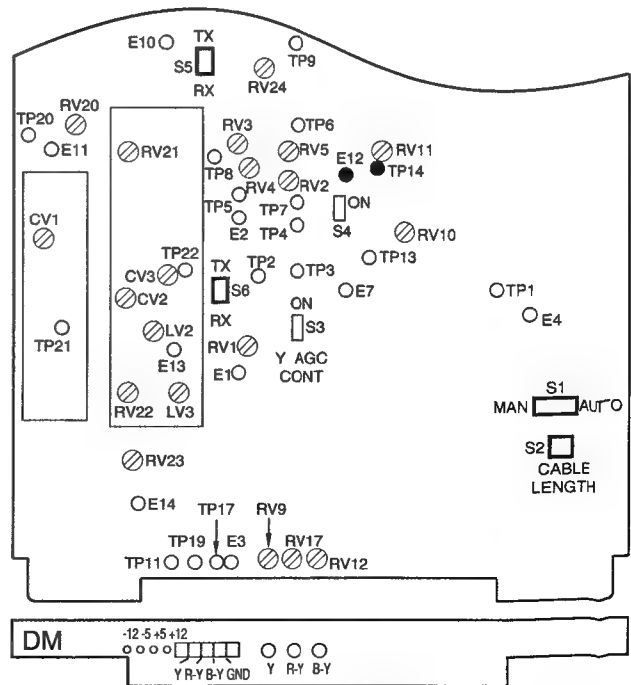
- CLOSE button/MSU-700 → "ON"

##### Adjustment Procedure

- Adjust  $\Phi$ FL8 (67.5 MHz TRAP) /MD-99 board so that 67.5 MHz frequency at pin 37 (GND: E101/MD-99) / extension board is minimum.



MD-99 BOARD (COMPONENT SIDE)



DM-94 BOARD /CCU-700 (COMPONENT SIDE)

#### 4-2-50. TX PROMPT VIDEO Demod. Adjustment

##### Note:

When adjusting this step, the length of triaxial cable is required 100 to 300 m.

Adjustment of CCU-700/700P must be completed.

**Equipment** : Oscilloscope, Video signal generator

**To be extended** : MD-99 board

##### Preparation:

- S4 (CCU→CAM ↔ CAM→CCU) switch/MD-99 board  
→ "CAM→CCU"
- Remove the green harness of MPX filter from CN23 (P) connector on DM-104 board, and connect it to CN21 connector on MB-568 board.
- Feed the 10 STEP signal from the video signal generator to PROMPT connector (camera side panel).
- S5 (TX ↔ RX) switch/DM-94 board (CCU-700/700P)  
→ "RX"
- S6 (TX ↔ RX) switch/DM-94 board (CCU-700/700P)  
→ "RX"
- S1 (MODE AUTO/MAN) switch/DM-94 board (CCU-700/700P)  
→ "MAN"
- S2 (CABLE LENGTH) switch/DM-94 board (CCU-700/700P)  
→ "1"

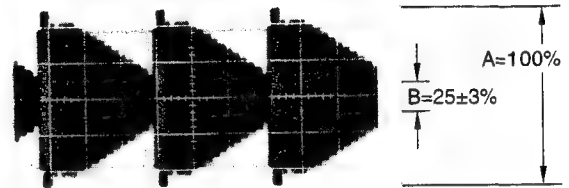
**Test point** : TP501 (GND: E501) /MD-99 board

**Adjusting point** : RV501 (PROMPT DEV) /MD-99 board

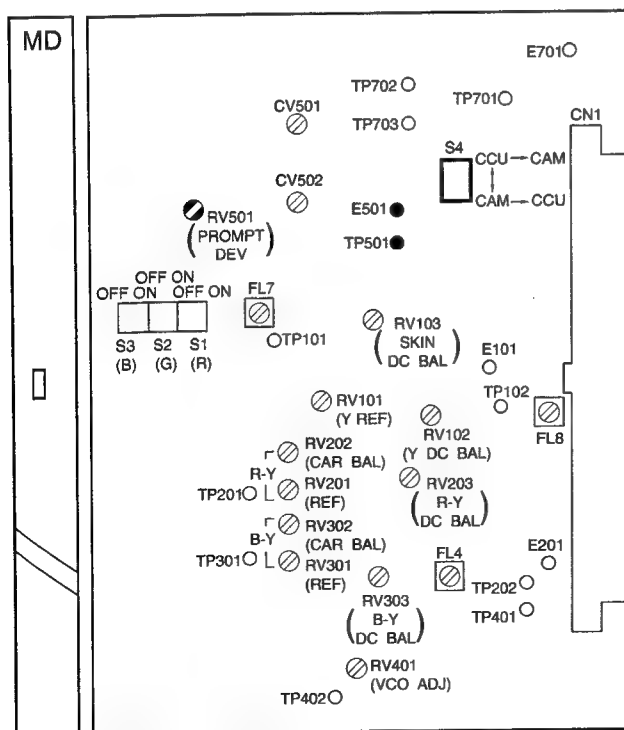
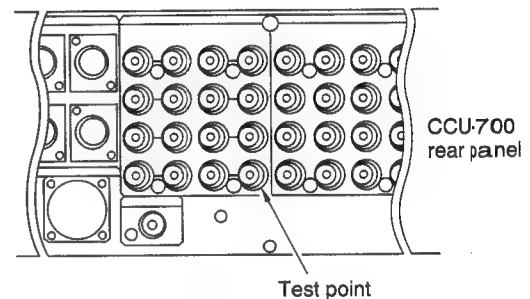
**Specification** : B = 25 ± 3 %

##### Adjustment Procedure

1. Adjust RV501 so that the level "B" at TP501 is 25 ± 3 % when the level "A" is 100 % by using VAR control knob on the oscilloscope.



2. Confirm that the video level at the following connector on CCU rear panel is 100 IRE (for PAL: 700 ± 10 mV).



MD-99 BOARD (COMPONENT SIDE)

##### Note:

After the adjustment, set the switches as follows.

- S4 (CCU→CAM ↔ CAM→CCU) switch/MD-99 board  
→ "CCU→CAM"
- Return the green harness of MPX filter to CN23 (P) connector on DM-104 board.
- S5 (TX ↔ RX) switch/DM-94 board (CCU-700/700P) → "TX"
- S6 (TX ↔ RX) switch/DM-94 board (CCU-700/700P) → "TX"
- S1 (MODE AUTO/MAN) switch/DM-94 board (CCU-700/700P)  
→ "AUTO"
- S2 (CABLE LENGTH) switch/DM-94 board (CCU-700/700P)  
→ "0"
- Remove the BNC cable from the PROMPT connector/CCU rear panel.

#### 4-2-51. TX PROMPT VIDEO BPF Adjustment

**Note:**

Make sure that the “4-2-50. TX PROMPT VIDEO Demod. Adjustment” is completed. When adjusting this step, the length of triaxial cable is 100 to 300 m.  
Adjustment of CCU-700/700P must be completed.

**Equipment** : Oscilloscope, Video signal generator

**To be extended :** MD-99 board

**Preparation:**

- S4 (CCU→CAM ↔ CAM→CCU) switch/MD-99 board  
→ “CAM→CCU”
  - Remove the green harness of MPX filter from CN23 (P) connector on DM-104 board, and connect it to CN21 connector on MB-568 board.
  - Feed the 10 STEP signal from the video signal generator to PROMPTER connector (camera side panel).
  - S5 (TX ↔ RX) switch/DM-94 board (CCU-700/700P)  
→ “RX”
  - S6 (TX ↔ RX) switch/DM-94 board (CCU-700/700P)  
→ “RX”
  - S1 (MODE AUTO/MAN) switch/DM-94 board (CCU-700/700P)  
→ “MAN”
  - S2 (CABLE LENGTH) switch/DM-94 board (CCU-700/700P)  
→ “1”
- Test point** : TP501 (GND: E501) /MD-99 board
- Adjusting point** : ⚙CV501 (BPF ADJ 1) /MD-99 board  
⚙CV502 (BPF ADJ 2) /MD-99 board

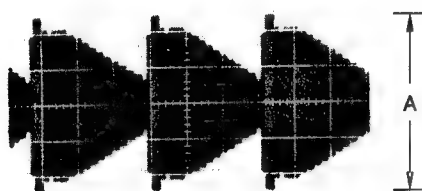
**Test point** : TP501 (GND: E501) /MD-99 board

**Adjusting point :** ●CV501 (BPF ADJ 1) /MD-99 board

●CV502 (BPF ADJ 2) /MD-99 board

### Adjustment Procedure

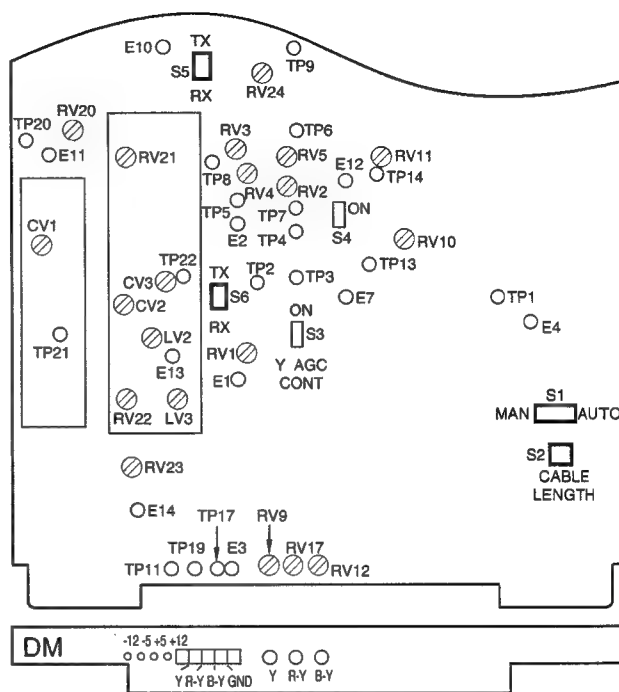
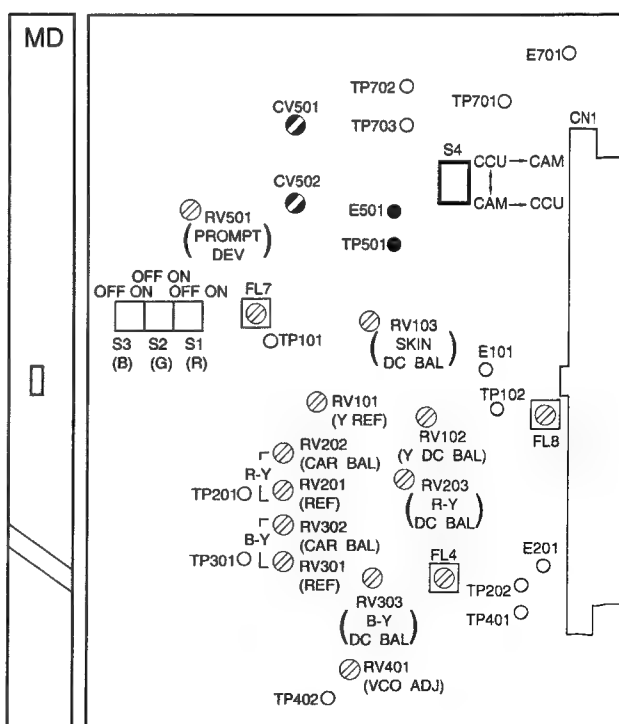
- Adjust ②CV501 and ②CV502 so that the level “A” is maximum.



**Note:**

After the adjustment, set the switches as follows.

- S4 (CCU→CAM ↔ CAM→CCU) switch/MD-99 board  
→ "CCU→CAM"
- Return the green harness of MPX filter to CN23 (P) connector on DM-104 board.
- S5 (TX ↔ RX) switch/DM-94 board (CCU-700/700P) → "TX"
- S6 (TX ↔ RX) switch/DM-94 board (CCU-700/700P) → "TX"
- S1 (MODE AUTO/MAN) switch/DM-94 board (CCU-700/700P) → "AUTO"
- S2 (CABLE LENGTH) switch/DM-94 board (CCU-700/700P) → "0"
- Remove the cable from the PROMPT connector/CCU rear panel.

**DM-94 BOARD /CCU-700 (COMPONENT SIDE)**

MD-99 BOARD (COMPONENT SIDE)



#### 4-2-52. Return video Demod. Adjustment

##### Note:

Perform the adjustment only when replacing  $\odot$ LV101 (RET FREQ) or  $\odot$ LV102 (RET TUNE) /DM-104 board. When adjusting this step, the length of triaxial cable is required 100 to 600 m.

Adjustment of CCU-700/700P must be completed.

**Equipment** : Waveform monitor, Vectorscope, Video signal generator (10 STEP signal with CHROMA signal)

##### Preparation:

- First remove the MPX filter, then the shield case on the DM-104 board.
- Feed the 10 STEP signal from the video signal generator to RET 1 IN connector/CCU rear panel.
- RET1 button/Camera rear panel → "ON"

**Test point** : MONITOR OUT connector (camera side panel)

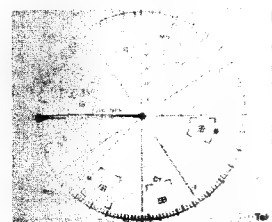
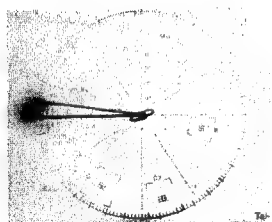
**Adjusting point** :  $\odot$ LV101 (RET FREQ) /DM-104 board  
 $\odot$ LV102 (RET TUNE) /DM-104 board

##### Adjustment Procedure

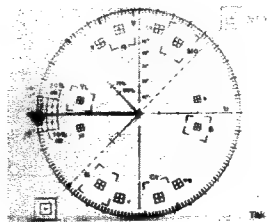
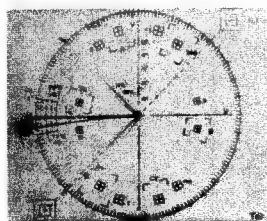
1. Observe the waveform monitor screen and adjust  $\odot$ LV102 (RET TUNE) /DM-104 board so that the waveform is appeared.
2. Observe the vectorscope screen and adjust  $\odot$ LV102 (RET TUNE) /DM-104 board so that the values of DG and DP are minimum.  
 Then, adjust  $\odot$ LV101 (RET FREQ) and  $\odot$ LV102 (RET TUNE) /DM-104 board alternately so that the values of DG and DP are more minimum.

**Specification** : DG : DP =  $\pm 3\%$  :  $\pm 3^\circ$

[NTSC]



[PAL]



#### 4-2-53. Return video Level Adjustment

##### Note:

When adjusting this step, the length of triaxial cable is required 100 to 600 m.

Adjustment of CCU-700/700P must be completed.

**Equipment** : Oscilloscope, Video signal generator (10 STEP signal)

##### Preparation:

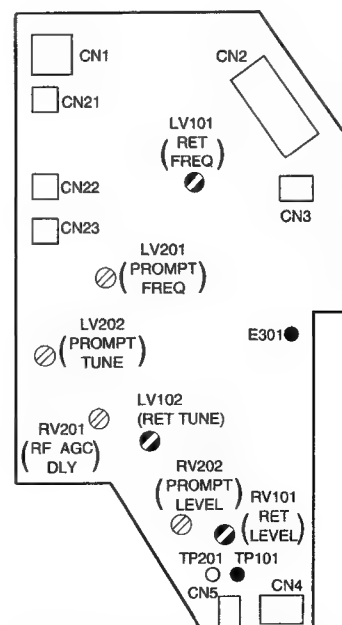
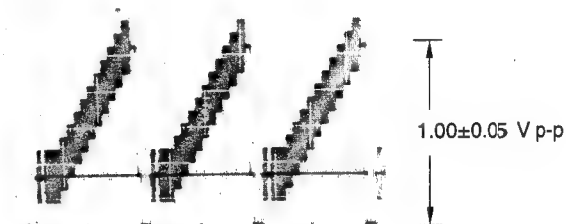
- First remove the MPX filter, then the shield case on the DM-104 board.
- Feed the 10 STEP signal from the video signal generator to RET 1 IN connector/CCU rear panel.
- RET 1 button/BVP rear panel → "ON"

**Test point**: TP101 (GND: E301) /DM-104 board

**Adjusting point**:  $\odot$ RV101 (RET LEVEL) /DM-104 board

##### Adjustment Procedure

- Adjust  $\odot$ RV101 (RET LEVEL) /DM-104 board so that the video level at TP101 (GND: E301) /DM-104 board is  $1.00 \pm 0.05$  V p-p.



DM-104 BOARD (COMPONENT SIDE)

#### 4-2-54. RX PROMPT VIDEO Demod. Adjustment

##### Note:

- Perform the adjustment only when replacing ⓪LV201 (PROMPT FREQ) /DM-104 board and ⓪LV202 (PROMPT TUNE) /DM-104 board. When adjusting this step, the length of triaxial cable is required 100 to 300 m.
- Adjustment of CCU-700/700P must be completed.

**Equipment** : Oscilloscope, Video signal generator (SWEEP signal, 10 STEP signal)

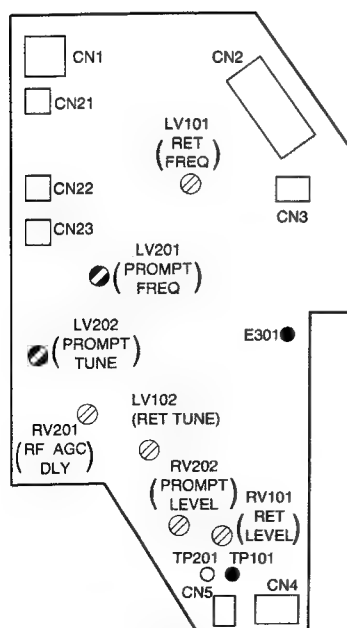
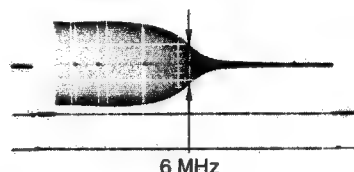
##### Preparation:

- S4 (CCU→CAM ↔ CAM→CCU) /MD-99 board  
→ "CCU→CAM"
- First remove the MPX filter, then the shield case on the DM-104 board.
- Connect the green harness of MPX filter to CN23 (P) connector on DM-104 board.
- S5 (TX ↔ RX) /DM-94 board (CCU-700/700P) → "TX"
- S6 (TX ↔ RX) /DM-94 board (CCU-700/700P) → "TX"
- S1 (MODE AUTO/MAN) /DM-94 board (CCU-700/700P)  
→ "AUTO"
- Feed the SWEEP signal from the video signal generator to PROMPTER IN connector (CCU rear panel).

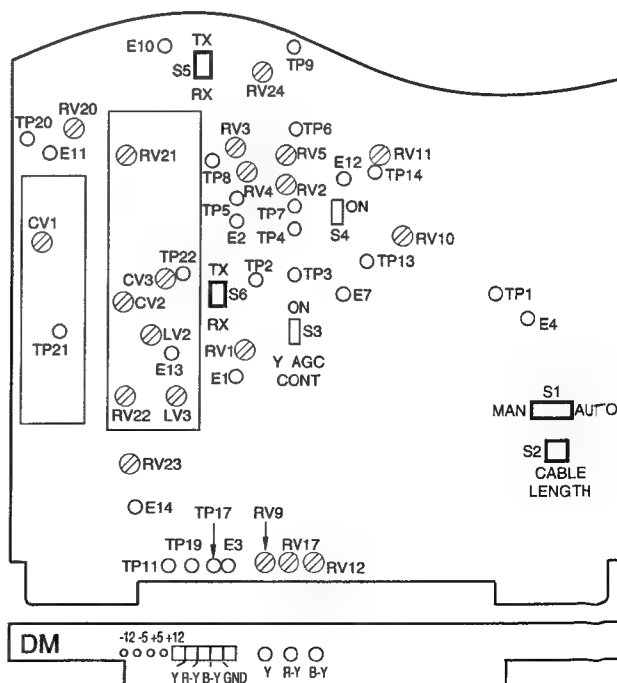
**Test point** : TP201 (GND: E301) /DM-104 board  
**Adjusting point** : ⓪LV201 (PROMPT FREQ) /DM-104 board  
 ⓪LV202 (PROMPT TUNE) /DM-104 board

##### Adjustment Procedure

1. Observe the waveform monitor screen and adjust ⓪LV202 (PROMPT TUNE) /DM-104 board so that the waveform is some intermediate demodulated.
2. Adjust ⓪LV201 (PROMPT FREQ) /DM-104 board so that the frequency response nearby 6 MHz is minimum.



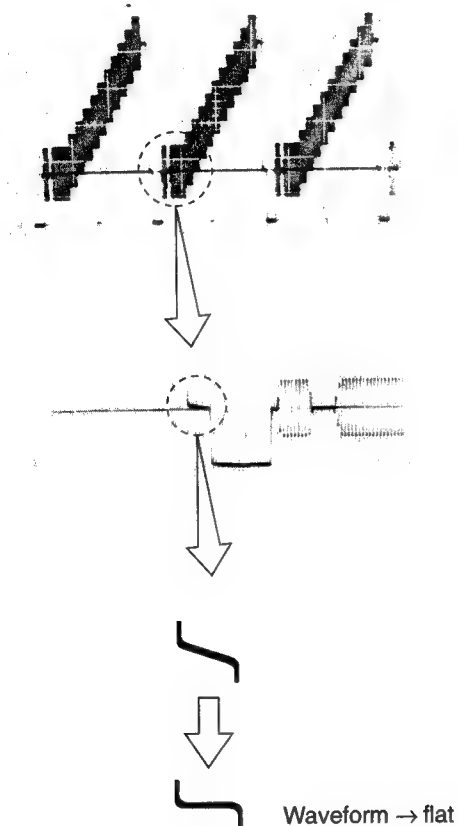
**DM-104 BOARD (COMPONENT SIDE)**



3. Set the output signal of the video signal generator to 10 STEP signal.

4. Adjust  $\odot$ LV202 (PROMPT TUNE) /DM-104 board so that the portion "A" of the waveform is flat.

**Note:** If the specification is not met, carry out "4-2-54. RX PROMPT VIDEO Demod. Adjustment" after carrying out "4-2-55. RX PROMPT VIDEO RF AGC Adjustment".)



#### 4-2-55. RX PROMPT VIDEO RF AGC Adjustment

##### **Note:**

When adjusting this step, the length of triaxial cable is required 50 to 150 m.

Adjustment of CCU-700/700P must be completed.

**Equipment** : Oscilloscope, Video signal generator (10 STEP signal)

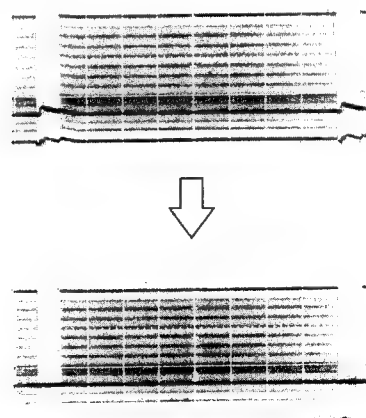
##### **Preparation:**

- S4 (CCU→CAM ↔ CAM→CCU) /MD-99 board → "CCU→CAM"
  - First remove the MPX filter, then the shield case on the DM-104 board.
  - Connect the green harness of MPX filter to CN23 (P) connector on DM-104 board.
  - S5 (TX ↔ RX) /DM-94 board (CCU-700/700P) → "TX"
  - S6 (TX ↔ RX) /DM-94 board (CCU-700/700P) → "TX"
  - S1 (MODE AUTO/MAN) /DM-94 board (CCU-700/700P) → "MAN"
  - S2 (CABLE LENGTH) /DM-94 board (CCU-700/700P) → "1"
  - Feed the 10 STEP signal from the video signal generator to PROMPTER IN connector/CCU rear panel.
- Test point** : TP201 (GND: E301) /DM-104 board
- Adjusting point** :  $\odot$ RV201 (RF AGC DLY) /DM-104 board

##### **Adjustment Procedure**

- Turn  $\odot$ RV201 (RF AGC DLY) /DM-104 board counterclockwise slowly from the rightmost position and stop where the V SYNC portion at waveform start to be flat.

**Note:** Take care not to over-turn  $\odot$ RV201.



##### **Note:**

After the adjustment, set as follows.

- S1 (MODE AUTO/MAN) /DM-94 board (CCU-700/700P) → "AUTO"
- S2 (CABLE LENGTH) /DM-94 board (CCU-700/700P) → "0"

#### 4-2-56. RX PROMPT VIDEO Level Adjustment

##### Note:

When adjusting this step, the length of triaxial cable is required 100 to 300 m.

Adjustment of CCU-700/700P must be completed.

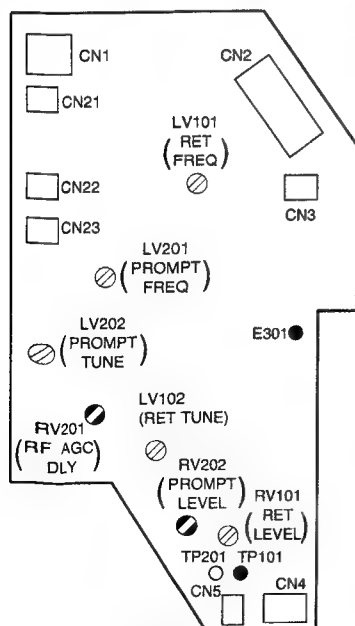
**Equipment** : Oscilloscope, Video signal generator  
(10 STEP signal)

##### Preparation:

- S4 (CCU→CAM ↔ CAM→CCU) /MD-99 board  
→ "CCU→CAM"
- First remove the MPX filter, then the shield case on the DM-104 board.
- Connect the green harness of MPX filter to CN23 (P) connector on DM-104 board.
- S5 (TX ↔ RX) /DM-94 board (CCU-700/700P) → "TX"
- S6 (TX ↔ RX) /DM-94 board (CCU-700/700P) → "TX"
- S1 (MODE AUTO/MAN) /DM-94 board (CCU-700/700P)  
→ "AUTO"
- Feed the 10 STEP signal from the video signal generator to PROMPTER IN connector/CCU rear panel.

##### Adjustment Procedure

- Adjust  $\odot$ RV202 (PROMPT LEVEL) /DM-104 board so that the video level at TP201 (GND: E301) /DM-104 board is  $2.00 \pm 0.05$  V p-p.



DM-104 BOARD (COMPONENT SIDE)

#### 4-2-57. Tuning Adjustment

##### Note:

Adjustment of CCU-700/700P must be completed.

**Equipment** : Digital voltmeter, DC power supply  
**To be extended** : TR-88 board (BVP-750/750P)  
AT-88 board (CCU-700/700P)

##### Adjustment Procedure

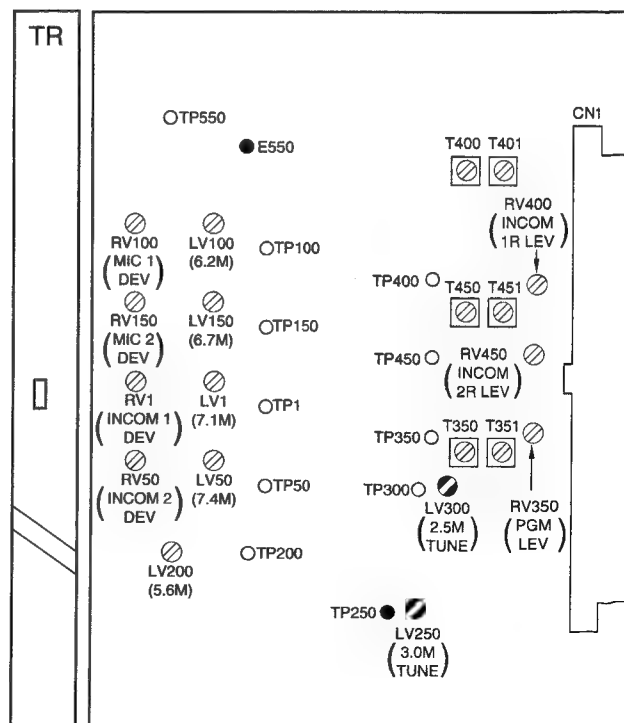
1. Adjust  $\odot$ LV250 (3.0 MHz TUNE) /TR-88 board so that the DC voltage at TP250 (GND: E550) /TR-88 board is  $+4.8 \pm 0.1$  V dc.
2. Remove VA-156 board from CCU-700/700P unit.
3. Feed +2.5 V dc voltage to CN1-pin C19/extension board (AT-88 board, CCU-700/700P).
4. Adjust  $\odot$ LV300 (2.5 MHz TUNE) /TR-88 board so that the DC voltage at pin 22 /extension board is  $+2.5 \pm 0.1$  V dc.
5. Install VA-156 board into the CCU-700/700P unit.

##### Note:

Read the board name in this section as following name.

[For NTSC] VA-156 → VA-156A

[For PAL] VA-156 → VA-156B



TR-88 BOARD (COMPONENT SIDE)

4-2-58. Frequency Set Adjustment

**Note:**  
Before adjustment, allow 10 minutes warm-up time.

**Equipment :** Frequency counter

**Adjustment Procedure**

**TR-88 board (GND: E80)**

|          | Test point | Adj. point | Specification   |
|----------|------------|------------|-----------------|
| CHU DATA | TP200      | ⦿LV200     | 5.100 ±0.05 MHz |
| INCOM 1  | TP1        | ⦿LV1       | 7.100 ±0.05 MHz |
| INCOM 2  | TP50       | ⦿LV50      | 7.400 ±0.05 MHz |
| MIC 1    | TP100      | ⦿LV100     | 6.200 ±0.05 MHz |
| MIC 2    | TP150      | ⦿LV150     | 6.700 ±0.05 MHz |

4-2-59. INCOM 1 Deviation Adjustment

**Equipment :** Spectrum analyzer, Oscilloscope,  
Audio generator

**To be extended :** TR-88 board

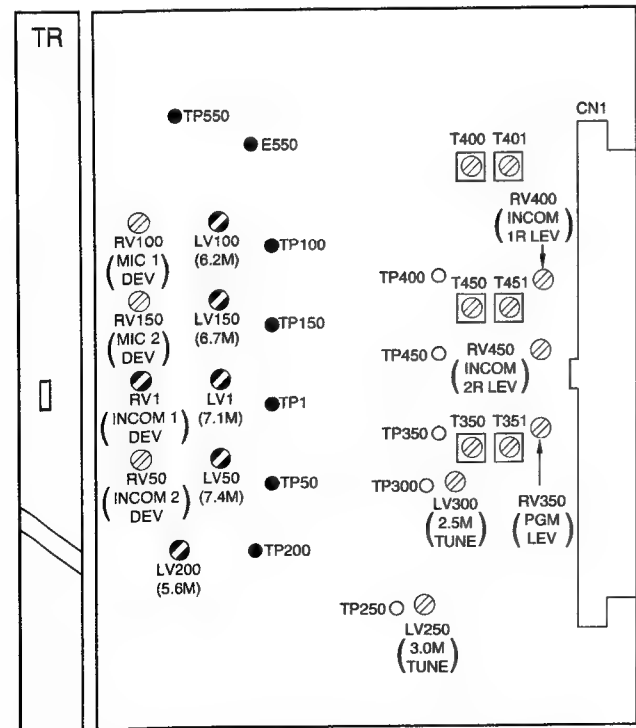
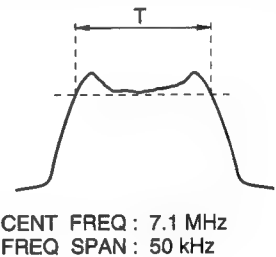
**Test point :** TP550 (GND: E550) /TR-88 board

**Adjusting point :** ⦿RV1 (INCOM 1 DEV) /TR-88 board

**Specification :** T = 20.0 ±0.5 kHz

**Adjustment Procedure**

1. Remove AU-199 board from BVP-750/750P unit.
2. Feed the following signal to CN1-pin 52 (X) and CN1-pin 50 (GND) on the extension board.  
...Fig. 1 (Refer to 4-1-3. audio connection)  
**Signal :** Sine wave  
**Frequency :** 400 Hz  
**Output Level :** 220 mV p-p
3. Connect a probe of spectrum analyzer to TP550, and adjust ⦿RV1 (INCOM 1 DEV) /TR-88 board so that T is 20.0 ±0.5 kHz.
4. Put AU-199 board back to BVP-750/750P unit.



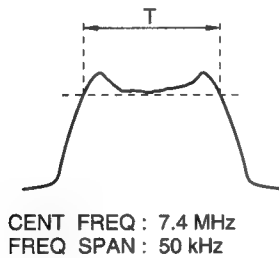
**TR-88 BOARD (COMPONENT SIDE)**

#### 4-2-60. INCOM 2 Deviation Adjustment

**Equipment** : Spectrum analyzer, Oscilloscope,  
Audio generator  
**To be extended** : TR-88 board  
**Test point** : TP550 (GND: E550) /TR-88 board  
**Adjusting point** : RV50 (INCOM 2 DEV) /TR-88 board  
**Specification** :  $T = 20.0 \pm 0.5$  kHz

##### Adjustment Procedure

1. Remove AU-199 board from BVP-750/750P unit.
2. Feed the following signal to CN1-pin 46 (X) and CN1-pin 44 (GND) on the extension board.  
...Fig. 1 (Refer to 4-1-3. audio connection)  
**Signal** : Sine wave  
**Frequency** : 400 Hz  
**Output Level** : 220 mV p-p
3. Connect a probe of spectrum analyzer to TP550, and adjust RV50 (INCOM 2 DEV) /TR-88 board so that T is  $20.0 \pm 0.5$  kHz.
4. Put AU-199 board back to BVP-750/750P unit.

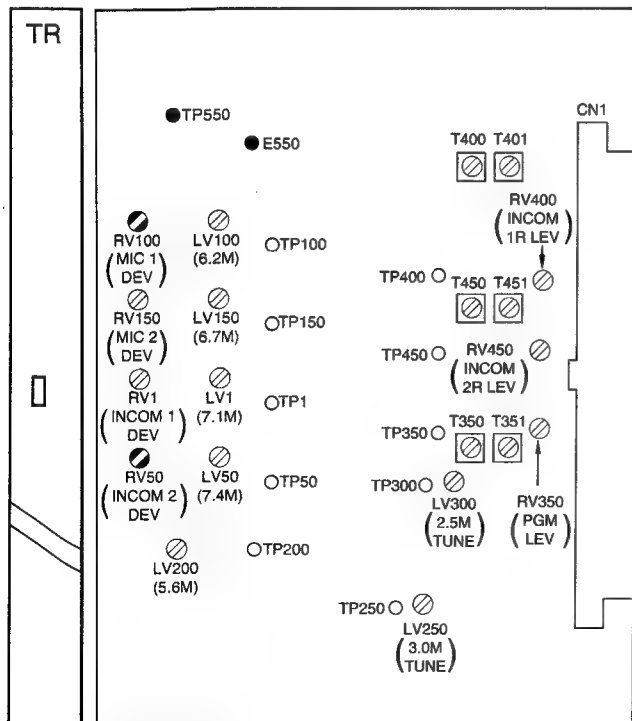
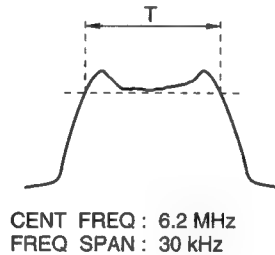


#### 4-2-61. MIC 1 Deviation Adjustment

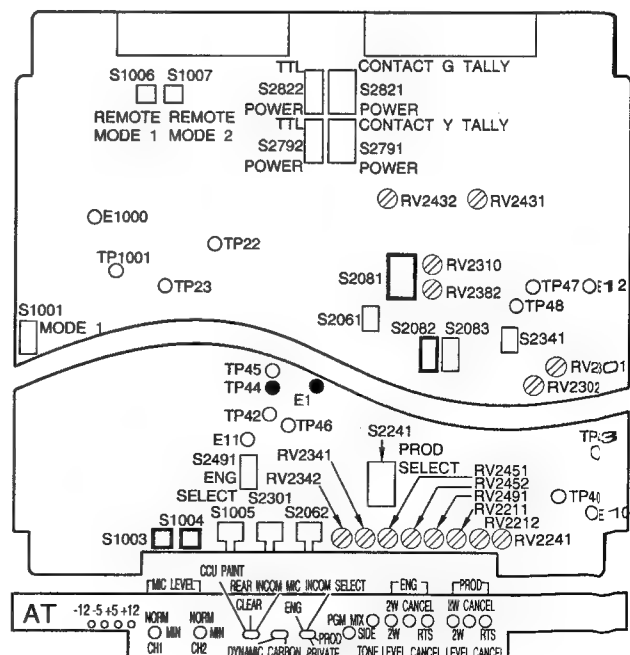
**Equipment** : Spectrum analyzer, Oscilloscope,  
Audio generator  
**To be extended** : TR-88 board  
**Test point** : TP550 (GND: E550) /TR-88 board  
**Adjusting point** : RV50 (MIC 1 DEV) /TR-88 board  
**Specification** :  $T = 16.0 \pm 0.5$  kHz

##### Adjustment Procedure

1. Remove AU-199 board from BVP-750/750P unit.
2. Feed the 400 Hz, 270 mV p-p sine-wave signal to CN1-pin 64 (X), pin 62 (GND) on the extension board.  
...Fig. 2 (Refer to 4-1-3. audio connection)
3. Connect a probe of spectrum analyzer to TP550, and adjust RV100 (MIC 1 DEV) /TR-88 board so that T is  $16.0 \pm 0.5$  kHz.
4. Put AU-199 board back to BVP-750/750P unit.



TR-88 BOARD (COMPONENT SIDE)



AT-88 BOARD /CCU-700 (COMPONENT SIDE)

#### 4-2-62. MIC 2 Deviation Adjustment

**Equipment** : Spectrum analyzer, Oscilloscope, Audio generator

**To be extended** : TR-88 board

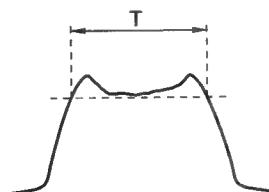
**Test point** : TP550 (GND: E550) /TR-88 board

**Adjusting point** : RV150 (MIC 2 DEV) /TR-88 board

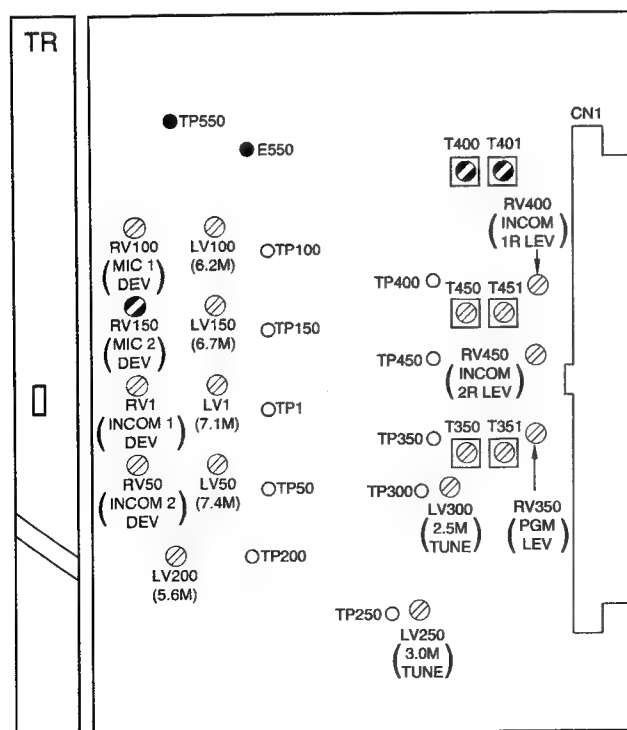
**Specification** :  $T = 18.0 \pm 0.5$  kHz

##### Adjustment Procedure

1. Feed the 400 Hz, 270 mV p-p sine-wave signal to CN1-pin 58 (X) , pin 56 (GND) on the extension board/TR-88 board.  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Connect a probe of spectrum analyzer to TP550, and adjust RV150 (MIC 2 DEV) /TR-88 board so that T is  $18.0 \pm 0.5$  kHz.



CENT FREQ : 6.7 MHz  
FREQ SPAN : 30 kHz



TR-88 BOARD (COMPONENT SIDE)

#### 4-2-63. INCOM 1 Demod. Adjustment

**Note:**

Perform the adjustment only when replacing T400/TR-88 board or T401/TR-88 board.

**Equipment** : Oscilloscope, Audio generator

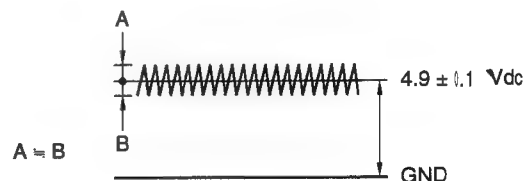
**To be extended** : TR-88 board

**Preparation:**

- Extend AT-88 board (CCU-700/700P) with extension board.
  - S2081 (0 dB/-20 dB) switch/AT-88 board → "0 dB"
- Test point** : TP400 (GND: E550) /TR-88 board
- Adjusting point** : T400/TR-88 board  
T401/TR-88 board

##### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP44 (GND: E1) /AT-88 board is 200 mV p-p.
3. S2082 (PGM MIX ON/OFF) /AT-88 board (CCU-700/700P) → "ON"
4. Connect a probe of oscilloscope to TP400 (GND: E550) /TR-88 board.
5. Adjust T400/TR-88 board slowly, and the sine-wave appears near 4.9 V dc, and then readjust it so that the level "A" and "B" on the 4.9 V dc are nearly equal.



6. Set the input AC/DC mode on the oscilloscope to "AC" mode, and adjust T401/TR-88 board so that the sine-wave is minimum.



7. Perform the adjustment in STEP 5 again.

#### 4-2-64. INCOM 1 Level Adjustment

**Equipment** : Oscilloscope, Audio generator

**To be extended** : TR-88 board

**Preparation:**

- Extend AT-88 board (CCU-700/700P) with extension board.

- S2081 (0 dB/-20 dB) switch/AT-88 board → "0 dB"

**Test point** : TP40/extension board (TR-88)

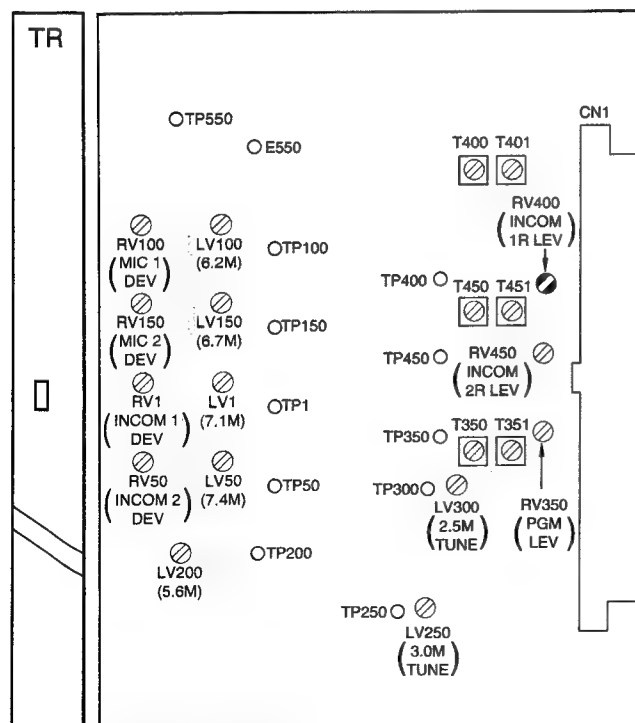
**Adjusting point** : RV400 (INCOM 1 R LEVEL) /TR-88 board

#### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP44 (GND: E1) /AT-88 board is 200 mV p-p.
3. Adjust RV400 (INCOM 1 R LEVEL) /TR-88 board so that the signal level at TP40/extension (TR-88) is 220 mV p-p.

#### Note:

After the adjustment, carry out "4-2-65. INCOM 1 SIDE TONE Adjustment".



TR-88 BOARD (COMPONENT SIDE)

#### 4-2-65. INCOM 1 SIDE TONE Adjustment (AU-199 board adjustment 1)

**Equipment** : Oscilloscope, Audio generator

**To be extended** : AU-199 board

**Preparation:**

- Extend AT-88 board (CCU-700/700P) with extension board.

- S2081 (0 dB/-20 dB) switch/AT-88 board → "0 dB"

- MIC 1 (ON/OFF) switch/ Camera rear panel → "ON"

**Test point** : pin 44 (GND: pin 45) /extension board (AU-199)

**Adjusting point** : RV240 (SIDE 1) /AU-199 board

#### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP48 (GND: TP46) /extension board (AU-199) is 220 mV p-p.
3. Adjust INCOM 1 Level control knob/BVP rear panel so that the signal level at pin 44 (GND: pin 45) / extension board (AU-199) is 2.2 V p-p.
4. S21 (MIC 1 GAIN) /AU-199 board → "0"  
S20 (INCOM 1) /AU-199 board → "CM"
5. Feed the following signal to CN1-pin 60 (X) and CN1-pin 61 (GND) on the extension board (AU-199).  
...Fig. 1 (Refer to 4-1-3. audio connection)

**Signal** : Sine wave

**Frequency** : 1 kHz

**Output Level** : 220 mV p-p

6. Adjust RV240 (SIDE 1) /AU-199 board so that the signal level at CN1-pin 44 (GND: pin 45) / extension board (AU-199) is 220 mV p-p.





#### 4-2-66. RTS 1 CANCEL Adjustment (AU-199 board adjustment 2)

**Equipment** : Oscilloscope, Audio generator

**To be extended** : AU-199 board

**Preparation:**

- Extend AT-88 board (CCU-700/700P) with extension board.

- S2081 (0 dB/-20 dB) switch/AT-88 board → "0 dB"

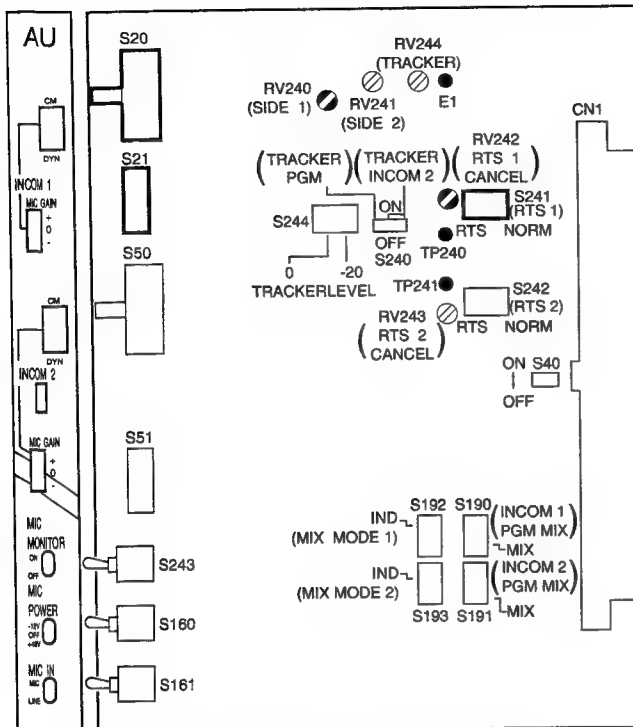
- S241 (RTS 1 RTS/NORM) /AU-199 board → "RTS"

**Test point** : TP240 (GND: E1) /AU-199 board

**Adjusting point** : RV242 (RTS 1 CANCEL)/AU-199 board

#### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP48 (GND: TP46) /AT-88 board is 220 mV p-p.
3. Adjust INCOM 1 Level control knob/BVP rear panel so that the signal level at pin 44 (GND: pin 45) / extension board (AU-199) is 2.2 V p-p.
4. Adjust RV242 (RTS 1 CANCEL) /AU-199 board so that the signal level at TP241 (GND: E1) /AU-199 board is minimum.



#### 4-2-67. INCOM 2 Demod. Adjustment

##### Note:

Perform the adjustment only when replacing  $\odot$ T450/TR-88 board or  $\odot$ T451/TR-88 board.

**Equipment** : Oscilloscope, Audio generator

**To be extended** : TR-88 board

##### Preparation:

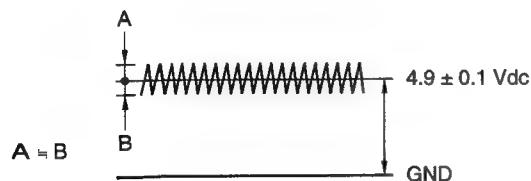
- Extend AT-88 board (CCU-700/700P) with extension board.
- S2081 (0 dB/-20 dB) switch/AT-88 board  $\rightarrow$  "0 dB"

**Test point** : TP450 (GND: E550) /TR-88 board

**Adjusting point** :  $\odot$ T450/TR-88 board  
 $\odot$ T451/TR-88 board

##### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
 ...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP44 (GND:E1) /AT-88 board is 200 mV p-p.
3. S2082 (PGM MIX ON/OFF) /AT-88 board (CCU-700/700P)  $\rightarrow$  "ON"
4. Connect a probe of oscilloscope to TP450 (GND: E550) / TR-88 board.
5. Adjust  $\odot$ T450/TR-88 board slowly, and the sine-wave appears near 4.9 V dc, and then readjust it so that the level "A" and "B" on the 4.9 V dc are nearly equal.



6. Set the input AC/DC mode on the oscilloscope to "AC" mode, and adjust  $\odot$ T451/TR-88 board so that the sine-wave is minimum.



7. Perform the adjustment in STEP 5 again.

#### 4-2-68. INCOM 2 Level Adjustment

**Equipment** : Oscilloscope, Audio generator

**To be extended** : TR-88 board

##### Preparation:

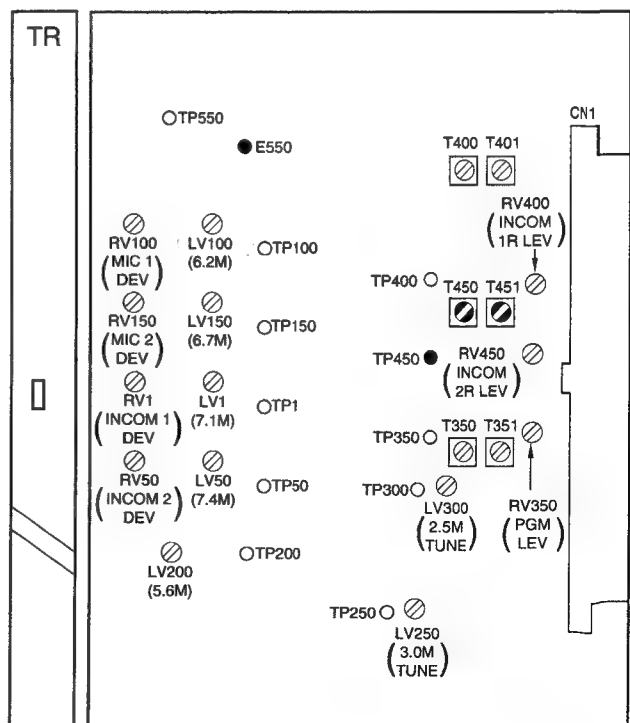
- Extend AT-88 board (CCU-700/700P) with extension board.
- S2081 (0 dB/-20 dB) switch/AT-88 board  $\rightarrow$  "0 dB"

**Test point** : TP34/extension board (TR-88)

**Adjusting point** :  $\odot$ RV450 (INCOM 2 R LEVEL) /TR-88 board

##### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
 ...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP44 (GND: E1) /AT-88 board is 200 mV p-p.
3. Adjust  $\odot$ RV450 (INCOM 2 R LEVEL) /TR-88 board so that the signal level at TP34/extension board (TR-88) is 220 mV p-p.



TR-88 BOARD (COMPONENT SIDE)

#### 4-2-69. INCOM 2 SIDE TONE Adjustment (AU-199 board adjustment 3)

**Equipment** : Oscilloscope, Audio generator

**To be extended** : AU-199 board

##### Preparation:

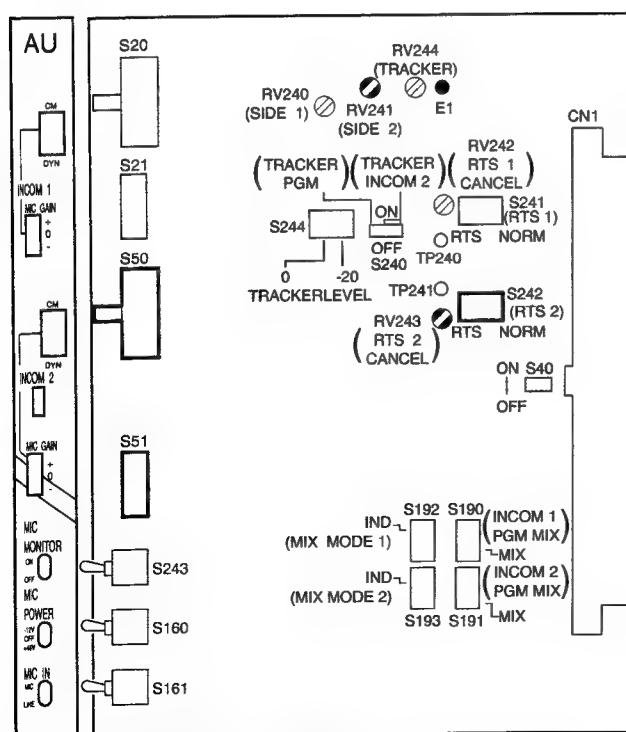
- Extend AT-88 board (CCU-700/700P) with extension board.
- S2081 (0 dB/-20 dB) switch/AT-88 board → "0 dB"
- MIC 2 (ON/OFF) switch/ Camera rear panel → "ON"

**Test point** : CN1-pin 36 (GND: pin 37) /extension board (AU-199)

**Adjusting point** : RV241 (SIDE 2) /AU-199 board

##### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X), pin A69 (Y), pin B69 (GND) on the extension board (AT-88).  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP40 (GND:TP38) /extension board (AU-199) is 220 mV p-p.
3. Adjust INCOM 2 Level control knob/BVP rear panel so that the signal level at pin 36 (GND: pin 37) /extension board (AU-199) is 2.2 V p-p.
4. S51 (MIC 2 GAIN) /AU-199 board → "0"  
S50 (INCOM 2) /AU-199 board → "CM"
5. Feed the following signal to CN1-pin 52 (X) and CN1-pin 53 (GND) on the extension board (AU-199).  
...Fig. 1 (Refer to 4-1-3. audio connection)  
**Signal** : Sine wave  
**Frequency** : 1 kHz  
**Output Level** : 220 mV p-p
6. Adjust RV241 (SIDE 2) /AU-199 board so that the signal level at CN1-pin 30 (GND: pin 31) /extension board (AU-199) is 220 mV p-p.



**AU-199/199P BOARD (COMPONENT SIDE)**



#### 4-2-72. PGM Level Adjustment

**Equipment** : Oscilloscope, Audio generator

**To be extended** : TR-88 board

**Preparation:**

- Extend AT-88 board (CCU-700/700P) with extension board.
- S2081 (0 dB/-20 dB) switch/AT-88 board → "0 dB"

**Test point** : TP28/extension board (TR-88)

**Adjusting point** : RV350 (PGM LEVEL) /TR-88 board

##### Adjustment Procedure

1. Feed the 1 kHz sine-wave signal to CN2-pin D68 (X) , pin A69 (Y) , pin B69 (GND) on the extension board (AT-88).  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust the level control of audio generator so that the audio level at TP44 (GND: E1) /AT-88 board is 200 mV p-p.
3. Adjust RV350 (PGM LEVEL) /TR-88 board so that the signal level at TP28/extension board (TR-88) is 220 mV p-p.



#### 4-2-73. TRACKER (T) Level Adjustment (AU-199 board adjustment 5)

**Equipment** : Oscilloscope, Audio generator

**To be extended** : AU-199 board

**Preparation:**

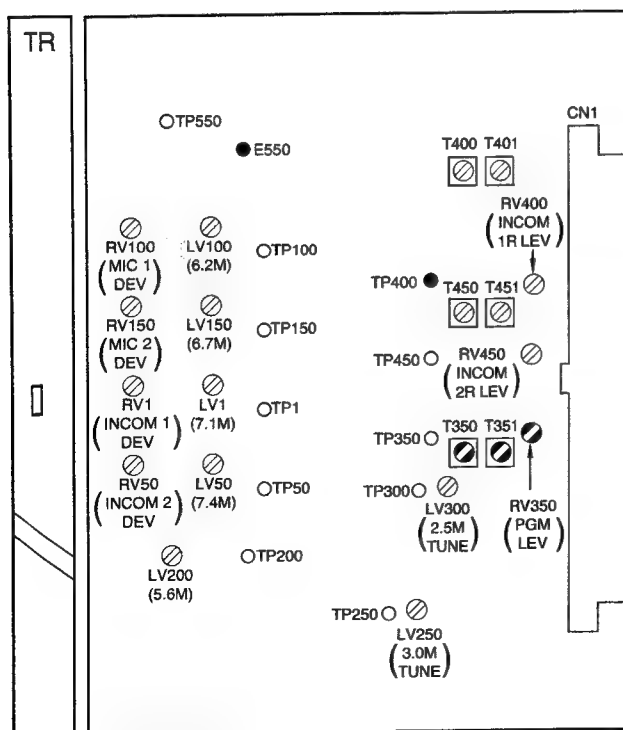
- S244 (TRACKER (T) 0/-20) /AU-199 board → "0"

**Test point** : TP64 (GND: TP62) /extension board

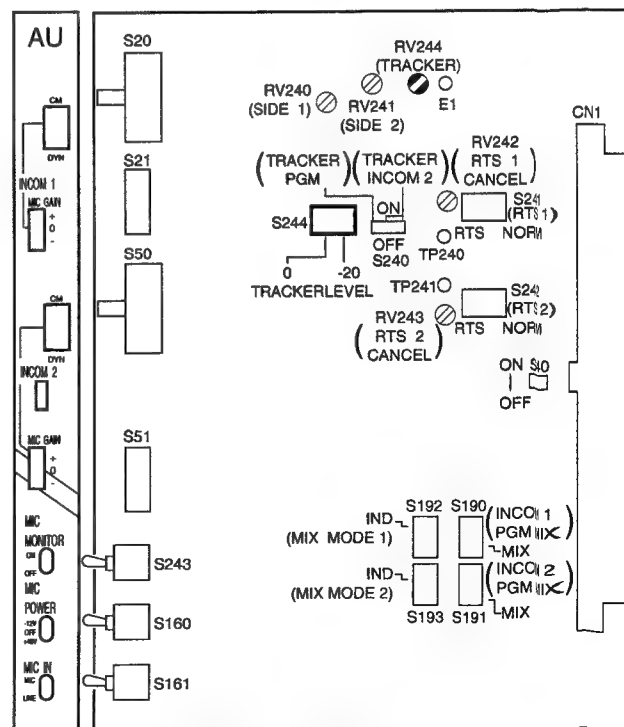
**Adjusting point** : RV244 (TRACKER (T) LEVEL) / AU-199 board

##### Adjustment Procedure

1. Feed the 1 kHz, 2.2 V p-p sine-wave signal to TP28 (X) , TP27 (Y) , TP29 (GND) on the extension board board.  
...Fig. 2 (Refer to 4-1-3. audio connection)
2. Adjust RV244 (TRACKER (T) LEVEL) /AU-199 board so that the signal level at TP64 (GND: TP62) / extension board is 220 mV p-p.



TR-88 BOARD (COMPONENT SIDE)



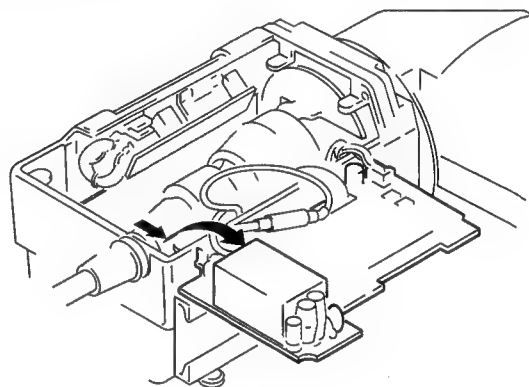
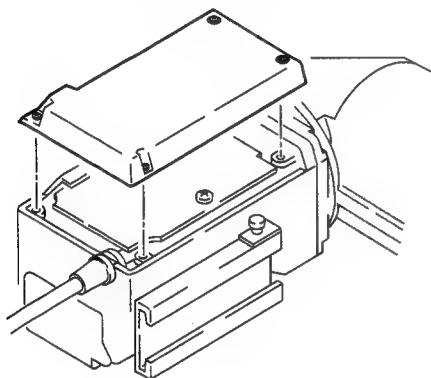
AU-199/199P BOARD (COMPONENT SIDE)

#### 4-2-74. Preparation of Viewfinder System Adjustment

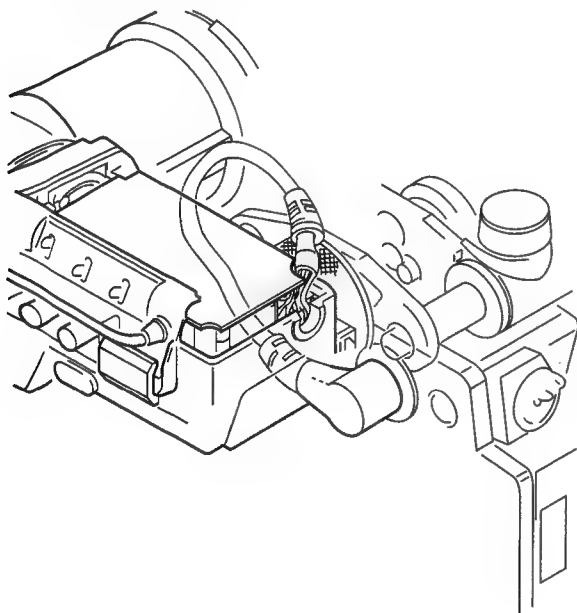
**Note:**

This adjustment should be performed after the camera is adjust completely.

1. turn OFF the main POWER switch (side panel) before adjustment.
2. Remove the viewfinder from the camera, then remove the VF cover.
4. As illustrated below, open the VF-56 board while moving it in the direction of the arrow and open the board so that the component side is placed to the upper position.



3. Turn the viewfinder upside down and install it to the camera.
5. Turn the main POWER switch to ON.



#### 4-2-75. Vertical Hold Adjustment

**Equipment** : Oscilloscope

**Board** : VF-56 board

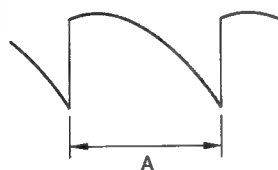
**Preparation:**

- Extend EN-120 board (BVP-750/750P), then connect TP81/extension board and TP82/extension board with shortcrip.
- Set  $\odot$ RV6 (V SIDE) /VF-56 board to the mechanical center. (When  $\odot$ RV6 is marked, it should not be turned.)

**Test point** : TP3 (GND: E1) /VF-56 board

**Adjusting point** :  $\odot$ RV5 (V HOLD) /VF-56 board

**Specification** : A =  $20.4 \pm 0.5$  ms



**Note:**

After adjustment is completed, remove the shortcrip on the EN-120 board.

#### 4-2-76. Horizontal Hold Adjustment

**Equipment** : Oscilloscope

**Board** : VF-56 board

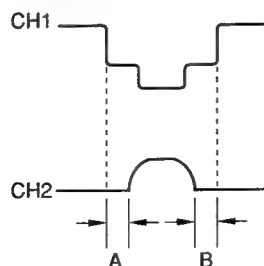
**Preparation:**

- Shoot the fully occupied white area and set the white level to  $100 \pm 2$  IRE.

**Test point** : CH-1. TP2 (GND: E1) /VF-56 board

CH-2. TP1 (GND: E1) /VF-56 board

**Adjusting point** :  $\odot$ RV3 (H HOLD) /VF-56 board



**Specification** : A = B

#### 4-2-77. Bright Set Adjustment

**Board** : VF-56 board

**Preparation:**

- Set S1/AT-90 board to "D", then turn the UP/DOWN switch to UP side.
- BRIGHT control (viewfinder): Fully counterclockwise  $\odot$
- CONTRAST control (viewfinder): Fully clockwise  $\odot$

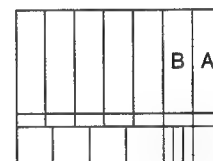
[for NTSC]

**Test point** : Viewfinder

**Adjusting point** :  $\odot$ RV9 (SUB BRIGHT) /VF-56 board

**Specification** : Adjust  $\odot$ RV9/VF-56 board so that portions A and B on the viewfinder screen can be barely discriminated.

Viewfinder Screen



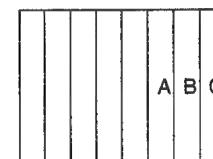
[for PAL]

**Test point** : Viewfinder

**Adjusting point** :  $\odot$ RV9 (SUB BRIGHT) /VF-56 board

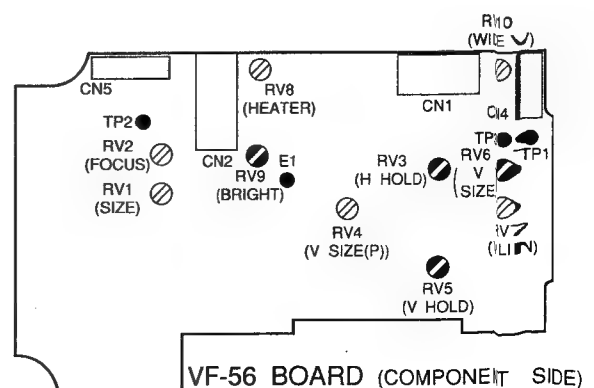
**Specification** : Adjust  $\odot$ RV9/VF-56 board so that portions A and B on the viewfinder screen can be barely discriminated, and B and C cannot be discriminated.

Viewfinder Screen



**Note:**

After adjustment is completed, turn the UP/DOWN switch to UP side. Then cancel the colorbar.



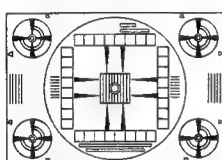
#### 4-2-78. Focus Adjustment

**Board** : VF-56 board

**Preparation:**

- Shoot the resolution chart in a full picture frame.
- Adjust the iris control so that the output level at the VIDEO OUT terminal is  $100 \pm 2$  IRE.
- Adjust the LENS FOCUS to the best focusing point on the black and white monitor.
- Set the BRIGHT and CONTRAST controls of the viewfinder to the mechanical center positions.

Viewfinder Screen



**Test point** : Viewfinder

**Adjusting point** :  $\odot$ RV2 (FOCUS) /VF-56 board

**Specification** : Gradually turn  $\odot$ RV2 (FOCUS) /VF-56 board from fully counterclockwise to clockwise, and adjust the best focus position. (RV should be turned slowly.)

**Note:**

After adjustment is completed, check that the focus operation can be performed irrespective of its BRIGHT and CONTRAST controls setting.

#### 4-2-79. Picture Frame Adjustment

**Board** : VF-56 board

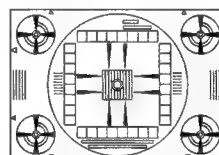
**Note:**

4-2-78. Focus adjustment and this adjustment affect each other. Repeat these adjustments until both specifications are met.

**Preparation:**

- BRIGHT control (viewfinder) : mechanical center
- CONTRAST control (viewfinder) : mechanical center
- PEAKING control (viewfinder) : mechanical center
- Shoot the resolution chart in the full underscan's picture frame by using the zoom lens.

Viewfinder Screen

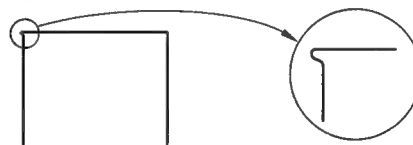


**Adjustment procedure**

**1. Test point** : Viewfinder

**Adj. point** :  $\odot$ RV3 (H HOLD) /VF-56 board

**Specification** : If the upper left corner of the picture

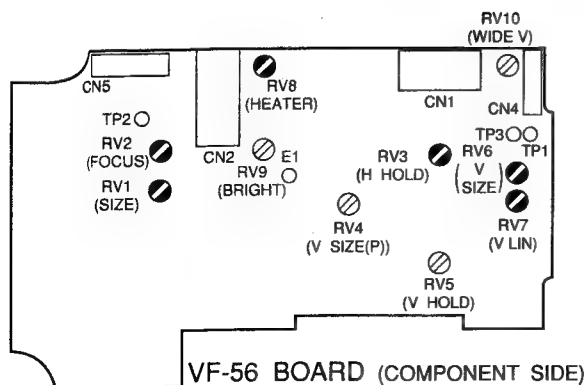


is distorted, make right angle.

**2. Test point** : Viewfinder

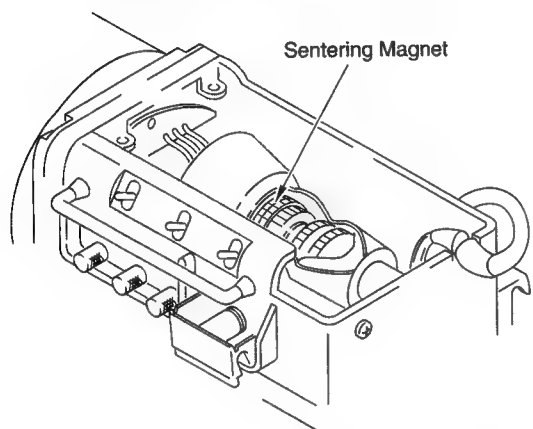
**Adj. point** :  $\odot$ RV7 (V LIN) /VF-56 board

**Specification** : Minimize the distortion of the four circles at the four corners of the resolution chart.

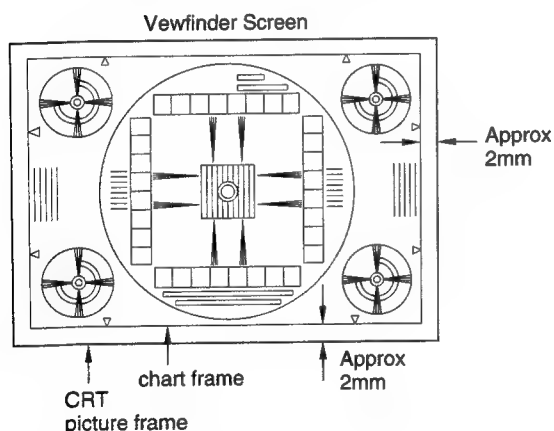




3. Test point : Viewfinder  
 Adj. point : ⌀RV1 (H SIZE) /VF-56 board  
 ⌀RV6 (V SIZE) /VF-56 board  
 ⌀Centering magnet



**Specification:** Adjust ⌀RV1 (H SIZE) and ⌀RV6 (V SIZE) so that the portions of the resolution chart are as shown below. Turn the centering magnet only when the left and lower corners cannot be adjusted.



After adjustment is completed, close the VF-32 board. Make sure that the picture is in the center of the viewfinder in the normal installing position on the unit.

**Note:**

When the paint-locked centering magnet is turned, paint-lock it again.

#### 4-2-80. Heater Voltage Adjustment

**Equipment :** Digital voltmeter

**Board :** VF-56 board

**Preparation:**

- Extend EN-120 board (BVP-750/750P), then connect TP81/extension board and TP82/extension board with shortcrip.

- BRIGHT control (viewfinder) : mechanical center

- CONTRAST control (viewfinder) : mechanical center

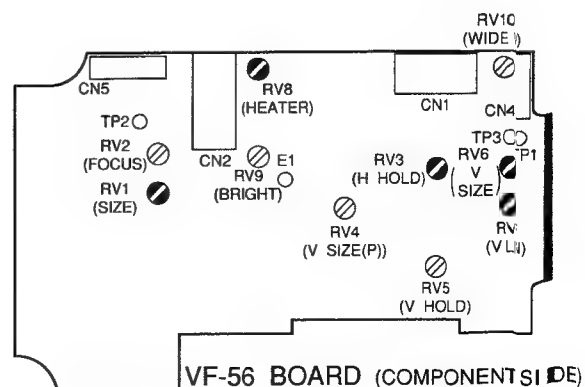
**Test point :** CN5-3 pin/VF-56 board  
 CN5-4 pin/VF-56 board

**Adjusting point :** ⌀RV8 (HEATER) /VF-56 board

**Specification :** 700 ±10 mV dc

**Note:**

After adjustment is completed, remove the shortcrip on the EN-120 board.



### 4-3. BOARD SWITCH SETTING AFTER FINISHING ADJUSTMENT

#### 1. Switch setting

Check the board switch setting after the adjustment is completed. Switches whose setting position put in parenthesis can be set according to use. They are set to the position in parenthesis at the factory.

##### [PR-197 board]

|                             |        |
|-----------------------------|--------|
| S901-1 (AT SLOPE)           | → ON   |
| S901-2 (WHITE CLIP ON/OFF)  | → ON   |
| S901-3 (GAMMA ON/OFF)       | → ON   |
| S901-4 (BLACK GAMMA ON/OFF) | → ON   |
| S901-5 (KNEE MAX ON/OFF)    | → (ON) |

##### [EN-120 board]

|                      |            |
|----------------------|------------|
| S1 (SELECT ↔ Y ONLY) | → (SELECT) |
| S2-1 (4:3 ATT)       | → (OFF)    |
| S2-2 (4:3 CURSOR)    | → (ON)     |
| S100 (VF ↔ RET)      | → (VF)     |
| S200-1 (ZEBRA 70 %)  | → (ON)     |
| S200-2 (ZEBRA 100 %) | → (ON)     |
| S400 (I/V)           | → (ON)     |
| S401 (Q/U)           | → (ON)     |
| S600 (CCU VBS ↔ Y)   | → (Y)      |
| S601-1 (CCU CALL)    | → (ON)     |
| S601-2 (CHU CALL)    | → (OFF)    |

##### [AU-199 board]

|                                 |                    |
|---------------------------------|--------------------|
| S40-1 (UNBAL)                   | → (OFF)            |
| S40-2 (UNBAL)                   | → (OFF)            |
| S150 (INCOM 1 PGM MIX)          | → Upper side (OFF) |
| S152 (INCOM 2 PGM MIX)          | → Upper side (OFF) |
| S350 (TRACKER (T) 0 dB/-20 dB)  | → (0 dB)           |
| S351 (MIC MONITOR ON/OFF)       | → (OFF)            |
| S352-1 (TRACKER/PGM ON/OFF)     | → (OFF)            |
| S352-2 (TRACKER/INCOM 2 ON/OFF) | → (OFF)            |
| S352-3 (TRACKER/INCOM 2 ON/OFF) | → (OFF)            |
| S800 (MIC POWER +48V/OFF/+12V)  | → (OFF)            |
| S801 (LINE LEVEL 0 dB/-20 dB)   | → (0 dB)           |
| S900 (RTS 1 NORM/RTS)           | → (NORM)           |
| S901 (RTS 2 NORM/RTS)           | → (NORM)           |


##### [MD-99 board]

|               |      |
|---------------|------|
| S1 (R ON/OFF) | → ON |
| S2 (G ON/OFF) | → ON |
| S3 (B ON/OFF) | → ON |

#### 2. Control setting

##### [AU-199 board]

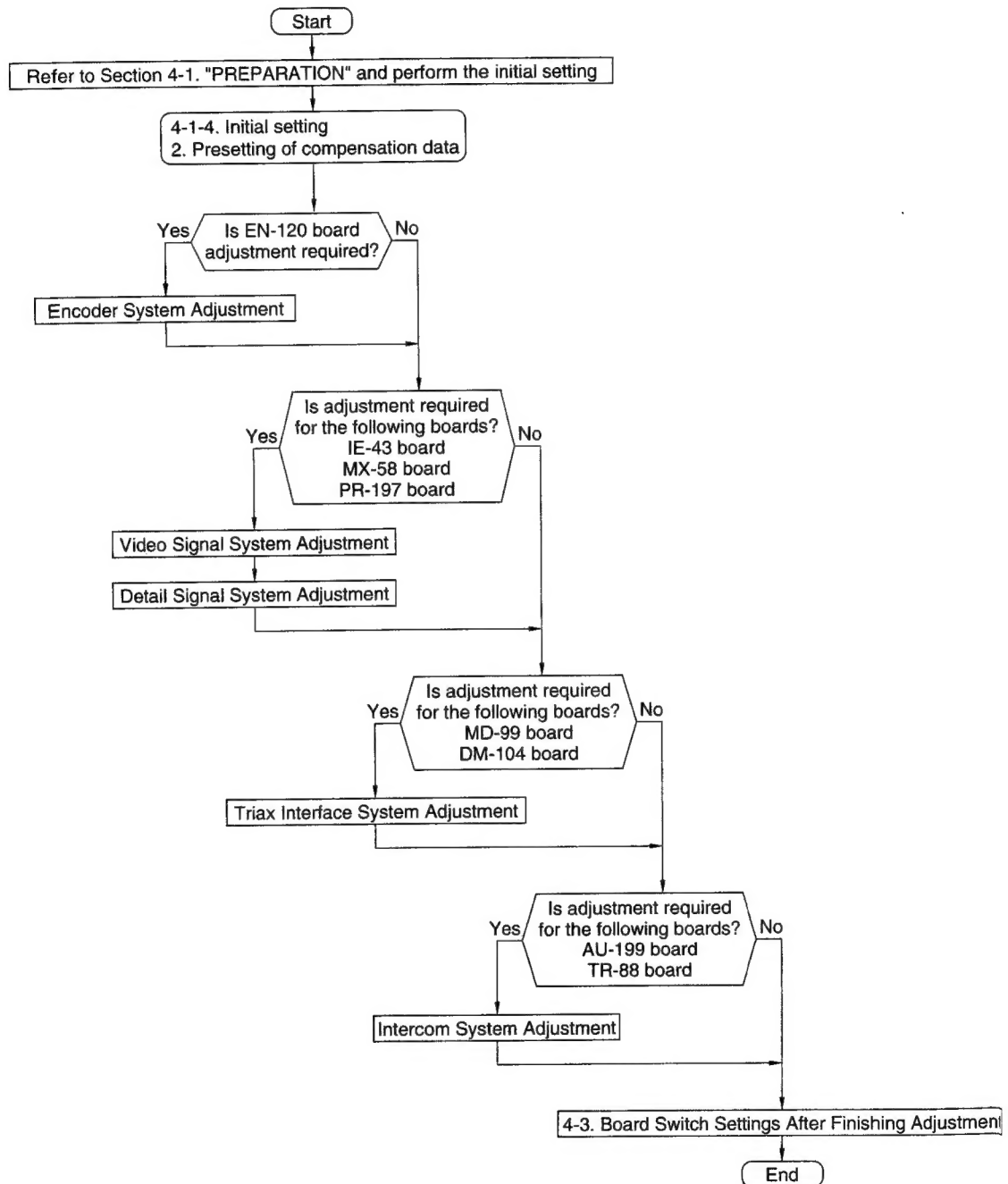
RV350 (TRACKER (T) LEVEL)

This controls audio level. this is set fully clockwise  at the factory, adjust to the preferred audio level.

## 4-4. PARTIAL ADJUSTMENT

### 4-4-1. Partial Adjustment Flowchart for EACH BOARD

Figure 4-1 is a flowchart for the partial adjustment for each board.




#### 4-4-2. Main Partial Adjustment Items


In this section, the main items most often requiring adjustment are identified.


When performing these adjustments, follow each flow chart completely from start to end.

##### Note:

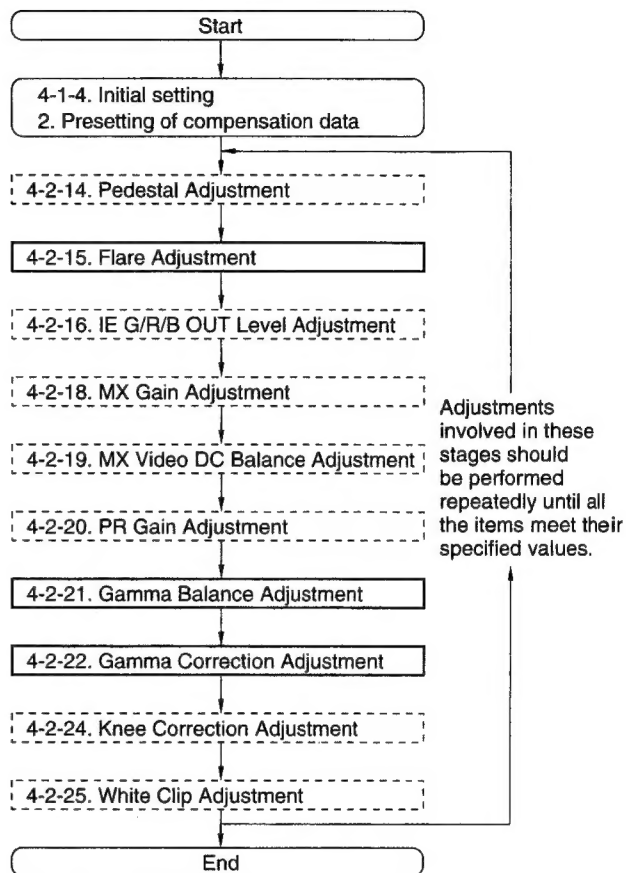
that it is not always necessary to adjust some items, and these are identified as follows;

 = These items are to be checked, but only require adjustment if they do not meet their specifications.

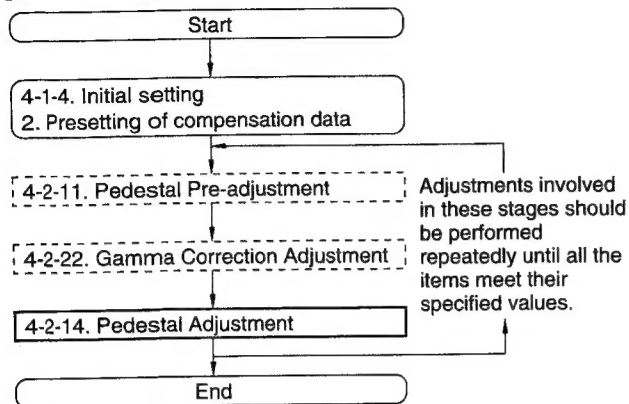
 = Main items

 = These adjustments must be performed with each main item.

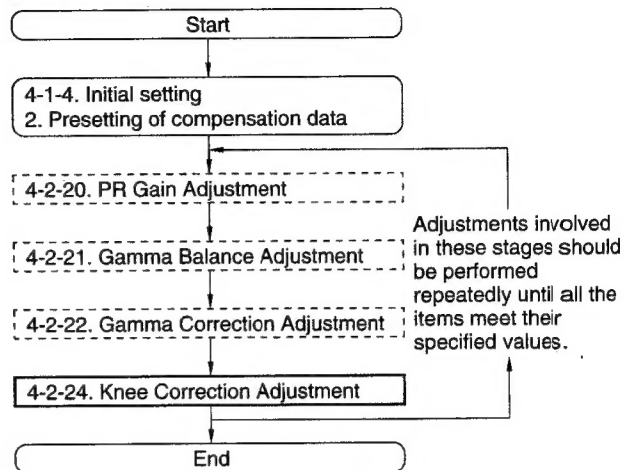
#### [White Balance Adjustment]



### [Pedestal Adjustment]



### [Knee Correction Adjustment]



### [Gamma Compensation Adjustment]

